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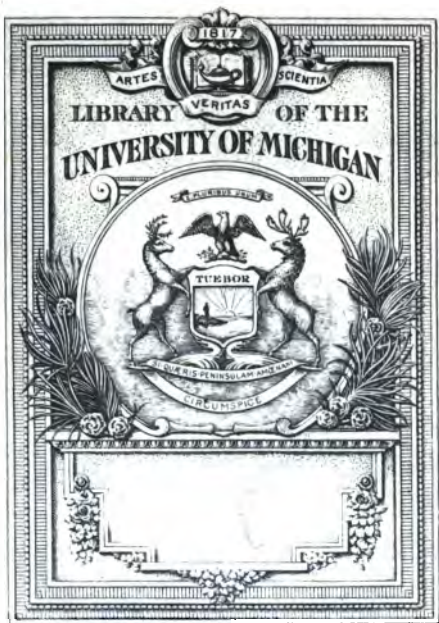
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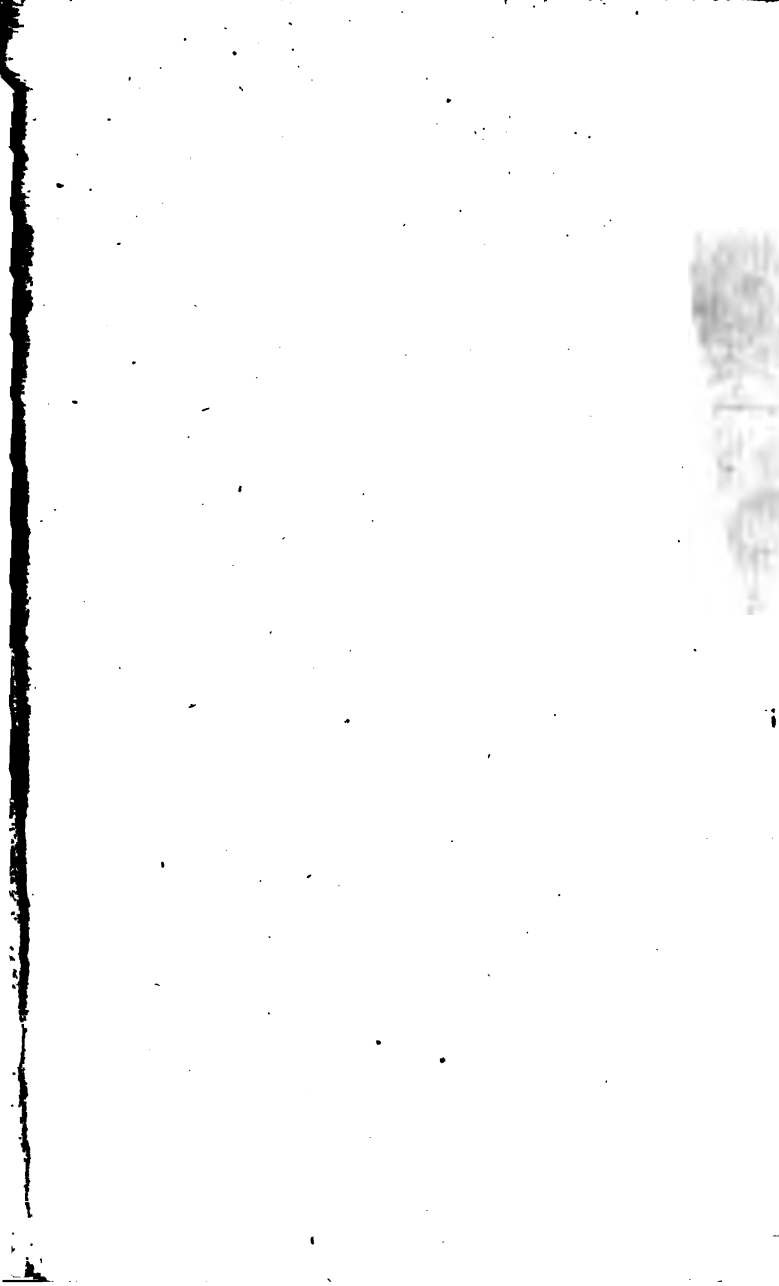
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THE
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OR,
Annual Miscellany

OF LITERATURE and SCIENCE:
For the BISSEXTILE-YEAR 1772.

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The *Second Part* consisting of *Answers* to the former Year's *Enquiries*;
with *new and curious Enquiries* for the present YEAR.

To which are added,
CHRONOLOGICAL RULES, with an *Alphabetical* CHRONICLE.

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INTRODUCTION.

Concerning CHRONOLOGY, or The ACCOUNT of TIME.

Inter Annos quæreret Verum.

TO render our *Palladium* as extensively useful as possible, we have, this Year, begun to insert our *Alphabetical Chronology* of the most memorable and remarkable Events, happening in the several Ages of the World; which (with other interesting Subjects) we design to continue annually, in different and successive *Alphabetical CHRONICLES*, marked I. II. III. &c. for Reference, and reducing some of them into *Chronological Classes*. And, as our principal View is Truth, and the general Improvement of useful Science, we shall esteem it a particular Favour done us, by our judicious Readers and Correspondents, if they will furnish us with the *Correction* of such Matters as shall happen to be found defective; and of such Dates as shall happen to deviate from the best Authorities, when compared therewith; especially with the leading Authorities and established Periods of remarkable Events, in the Table of successive Chronology, inserted in *Palladium*, 1764, P. 79 and following. Their Improvements and Corrections, with their Names, shall be inserted in future *Palladiums*, in Honour of their Discoveries and Merit.

Of Ancient CHRONOLOGY.

So uncertain was ancient Chronology, before Sir Isaac Newton reformed and corrected it, (see his *Chronology*), that the Time of some Events differed from the Truth some Hundreds of Years, when he adjusted the Mistakes of Chronologers by his accurate Reasoning and Judgement. But, notwithstanding his sagacious Reformation of ancient Chronology, we find that several Champions for Error, with their Advocates, have commenced Hostilities against this great Author's Conclusions; particularly the Rev. Dr. Rutherford, Regius Professor of Divinity in the University of Cambridge, who attacks his Account of the Argonautic Expedition, on which his Reformation of Chronology is founded; and the no less redoubted Champion for Error, Dr. Bedford, taking the Part with 4 Bishops, opposed Sir Isaac Newton's Arguments and Conclusions; but these Leaders and their Host of Followers (like Lucifer and his Legions making War against Heaven) have been totally defeated by the invincible Artillery of Mr. Emerson, (at the End of his Comment on Sir I. Newton's *Principia*, in Defence thereof, his *Optics* and *Chronology*), who has discomfited them, one and all, and covered them with Shame and Confusion.

Of Modern CHRONOLOGY.

Our modern *Chronologists* are not agreed about the true Year, or Epocha, of Christ's Birth, on which the true Era or Reckoning of Christ depends; and, consequently, other Eras depending upon it; some making the Birth of Christ 4 Years before the vulgar Epocha, or Time. This they deduce from the Computation of a lunar Eclipse, which Josephus tells us happened a little before (without saying how much) the Death of Herod the Great, in whose Time our Saviour was born. The Time of which Eclipse is computed by Kepler, and by Whiston our Countryman; who, in his *Astronomy*, makes it happen, March 12^d 15^h, with which Brent, in his *Astronomy*, agrees; being on Monday, March 13^d, at 3^h Morning, Julian Style; 4 Years before the Beginning of the vulgar Epocha. But Nicholas (not Michael) Man, Esq. late Master of the Charter-house School, London, in his *Chronology*, makes the true Year of Christ's Birth just 6 Years before the common Year. Mr. Emerson, in his *Chronology*, (from Sir Isaac Newton's *Principles*), sets down the Time only 2 Years before the common Year; whose Judgement and Reasoning running in a Parallel with Sir Isaac Newton's, his Epocha of Christ's Birth is the most to be

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be relied on. For an *Eclipse* of the *Moon* may happen, for many Years together, preceding a little (*more or less*) the Death of *Herod*, or Birth of *Christ*, in one or other of the Calendar Months of different *Julian* Years. As to Calculation, though the different Accounts of Time, preceding the *Julian* Account, confuse it, yet any *Phænomenon*, happening in *Antiquity*, being reduced, from any Form of reckoning Time, to that of the *Julian Period*, (invented by *Scaliger*), may thence be reduced to that of the late uniform *Julian Style*, or even to the present *Gregorian* Form of reckoning Time. Either of which *Forms* (though there was no *Julian* Account before the Year 46 preceding, nor since the Year 1752, after, *Christ*) may be carried back, as far as we please, (*see our Royal Astronomer*), for proving the Time of any Event, or *Phænomenon*, related in History; due Regard being had to the *Changes* of reckoning Time, the *Points* of Change, and *Continuance* of each; with the *lunar* Years and Years of *Confusion*. From the Neglect of Chronologers, in observing and noting these *Incidents* as they happened, proceeded numerous *Errors* in Chronology, and much *Confusion* in fixing the Time of Events. Whereas, had the Account of Time been continued by the *Egyptian* Year of 365 Days, the *Julian* Year since, of 365½ Days, or the *lunar* Year of 354 Days, a great Deal of *Error* and *Confusion* in Chronology had been prevented; being the *fittest* *Forms* of reckoning Time for Calculation; provided one Time had been always kept for a Year.

The *lunisolar* Year, of 360 Days, the most *antient* Year of all, consisted of 12 *Lunations*, or Months, of 30 Days each; which falling short of the true *solar* Year of 365 Days, 5 Hours, 48 Minutes, 55 Seconds, the *Antients* added a Month, when they found their Account of Time fall short of the *Seasons*; and omitted a Day or two in an *intercalary* Month, when they found it longer than the Course of the *Moon*. A *lunar* or *synodical* Month contains 29 Days, 12 Hours, 44 Minutes, 3 Seconds; 12 of which Months making the mean *lunar* Year 354 Days, 8 Hours, 48 Minutes, and 36 Seconds, instead of 354 Days reckoned; being 10 Days, 21 Hours, 0 Minutes, 18 Seconds, short of the *solar* Year. But these and other *Shiftings*, in the *antient* and different Accounts of Time, are so many contributing *Causes* to the *Confusions* and *Uncertainties* of Chronology, requiring the Sagacity of a *Newton*, or an *Emerson*, to correct.

The 12 Months of the Year, before the Time of *Julius Caesar*, consisted, alternately, of 29 and 30 Days in Succession; making the *lunar* Year (of 354 Days), or *lunar* Account of Time, uniform; by which *Contrivance*, the *new* *Moon*, when once properly adjusted, kept to the 1st Day of every Month. And the Year, in those Days, always begun with the *new* *Moon* nearest the *vernal* Equinox. But *Julius Caesar*, afterwards, ordered the Months, alternately, to consist of 31 and 30 Days each, from the 1st Month, *March*, of 31 Days, in Succession, to *January* of 31 Days; ordering *February*, the last Month, to consist of 29 only; but in *Leap-Year* of 30 Days. This *Julian* Year was thus kept uniform, till *Augustus Caesar* altered it, and ordered, for no sufficient Reason, *August* to consist of 31, instead of 30, Days, as formerly; and *February* of 28, instead of 29, as before his Time, and 29 Days in *Leap-Year*; making (as it were) two *Beginnings*, at the 1st of *January*, and at the 1st of *March*; where there are two Changes of the Order of the *Dominical* Letter, and of all Things depending on it, as observed by Mr. *Emerson* in his Chronology. Who farther observes the manifest *Absurdity* of thus dividing the Year into two *Fragments*, governed by different Rules. First the *Absurdity* appears of introducing a Day into the Midst of a Year, without Room or Occasion for it; and then into the Midst of a Month, by reckoning the 24th of *February* twice; as if one Day could be two, or two Days could be one. To, partly, get rid of this *Absurdity*, used in the Times after *Julius Caesar*, this *intercalary* Day was, in *England*, introduced at the End of *February*; where it had come in properly, if our late *Style-Act* had, for greater Advantage, ordered

March, in which happens the *vernal Equinox*, to be the first Month, and *February* (the rest in Order) the last Month of the Year. But because other Nations in *Europe*, improperly, keep their Account of Time according to *Augustus Caesar's* and *Pope Gregory's* Establishments, (the latter making a Decree against the Earth's Motion), we, to correspond with their Accounts, follow their Example, in the *Inproprieties*, that *Augustus Caesar* first, and then *Pope Gregory* afterwards, imposed on all *Christianity* to observe. But his Holiness had done better, if he had rectified the *civil Year* to the Time of *Christ's* Birth, when the *Epocha* of his *Æra* began, and when the *vernal Equinox* was on the 24th or 25th of *March*, and not from the Date of the Council of *Nice*, when the *vernal Equinox* was on the 21st of *March*.

The *Protestant States of Germany*, wisely rejecting the *Pope's Mandate*, when they altered their *Calendar*, ordered 11 Days to be left out of *February* in the Year 1700; directing *March* the 1st to be reckoned instead of *February* the 19th. Who directed, that the Time of *Easter* should be observed on the first Sunday after the first full Moon after the *vernal Equinox*: Or on the Sunday next after, when that full Moon fell on a Sunday. To be determined by astronomical Calculation. Which Rule has the Advantage of the Rule in our *Act* for Truth, that differed from the Table in the *Style-Act* itself, in the Year 1761, (as observed by Mr. *Emerson* in his *Chronology*), by a Month later, (and more of the like Instances may happen), occasioned by the *Act*, making the *vernal Equinox* constantly on the 21st of *March*, that happened on the 20th in 1761: And, notwithstanding our Rule, in the said *Act*, was prejudged by our then *Astronomer Royal*, and others eminent for their Skill in *Astronomy*, these Mistakes happen.

Since Mr. *Emerson* has told us, that the *Passion of Christ* (see his *Chronology*) was, probably, on *Friday*, the 14th of the *Jewish* Month *Nisan*, which reduces to *Friday, April the 23d, Julian Style*; when the *Equinox* was on *March* the 24th, but now on the 20th of *March*, or 4 Days sooner; if the *Passion* then is reduced to the present Date of *Christ*, it will fall (as Mr. *Emerson* observes) on the 19th of *April*; and the *Resurrection*, two Days after, on the 21st of *April*, exactly, in the same Season; which is all required for commemorating so distinguished and remarkable an Event. And therefore if (as Mr. *Emerson* observes) the nearest Sunday to *April* the 21st had been directed for commemorating *Christ's Resurrection*, or observing *Easter*, the Rule had been easy, certain, and sufficient, without perplexing so many Judgements, and such a Confusion made about it, for projecting a Rule, involved in Doubts and Difficulties, and farther from the Truth.

It had been another Advantage, if the original Form of the *Julian Year* had been continued. The Year to begin with *March*, wherein the *vernal Equinox* happens; where all astronomical Computations begin. The *intercalary Day* to come in properly at the End *February*, the End of the Year, without the *Dominical Letter's* being interrupted, as in the present Account. One *Dominical Letter*, beginning at *March* and ending in *February*, would have served for every whole Year. In *Leap-Year*, *February* would have contained 30 instead of 29 Days in the common Year; and the Succession of 31 and 30 Days, alternately, in each Month, from *March*, had been completed and ended in *February*, at the Year's End. And adding 1 Day for every Month past *March* to the Day of the Moon's Change in *March*, would have shewn the Change in the present Month.

The *Gregorian Alteration of Style*, 1752, in *England*, might, this Way, have taken Place with more Advantage than at present, by making every *Hundredth Year*, not divisible by 4, to be *Leap-Year*; improving it with the Rule for finding *Easter*, continually, by the nearest Sunday to *April* the 21st, as the Season stood at *Christ's* Resurrection. But Mr. *Emerson* remarks, that 7 Days might have been added, by *Act of Parliament*, to the Month-day, once in 1000 Years;

Years; which would have best come in to end with the Year. Who justly observes, that *shifting* the Year so often, to agree so exactly with the *Seasons* and with the *Fall of Easter, the Holidays, Law-Terms, Fairs, &c.* (which kept near the *same Season*, once a Year, is sufficient; or why is *Christ's Nativity* commemorated on the 25th of *December*, whose Birth is calculated, as *afore-said*, to have happened on *Monday, March 13^d 3^h, Morning?*) is like *shifting* the Fire to a Person, to save him the Trouble of going to it. Or, it may be compared to hoisting up Horses, or lowering them down, by *Tackles*, to feed upon the Grass growing on *Eminences*, or *Declivities*, instead of cutting it down and bringing it to them.

So, likewise, among the *modern Schemers* for discovering the *Longitude*, we find (since the Time of Sir *Isaac Newton* and Dr. *Halley*) that those Persons have been most authorised to judge of the *best Methods* for that End, by *Sea and Land*, who are *least* qualified in *mathematical Science and Calculation*. Mr. *Emerson's* Judgement was never consulted in the *most important Decisions* for this Nation, where the utmost *Genius and Abilities* of an universal *Mathematician* were required. But the Judgement of *inferior Calculators*, connected with *University Professors*, has (through *Favour and Interest*) been preferred, as to the *best Means* of *discovering or improving the Longitude*, though hitherto failing. As if the *Talents of real Mathematicians* (since the Days of the illustrious *Gregory, Keil, Halley, Barrow, Newton, Cotes, Saunderson, &c.* Men of *Genius and real Science*) and *Connections with Oxford and Cambridge* were inseparably united. The contrary of which appears, in *Mayer's astronomical Tables*, published according to his *original Error*, by the *Conductor general of Longitude*, 1 whole Year erroneous in *Chronology*. For this reverend *Conductor* has represented the Year of *Christ's Birth* (which is truly expressed *Anno Christi 1*) by a Cypher, 0, as a Year of *Non-Entity*; which 0 Year of *Christ* (as 1st Year before, and 1st Year since, *Christ* came together) is in *Place* of 1st Year before *Christ*, it being *Leap-Year*. Consequently, the reverend *Conductor* must alter or reprint his 100, 200, 300, &c. Years before *Christ*, represented for *Leap-Years*, (which are not so), to 101, 201, 301, &c. before *Christ*, which are truly *Leap-Years*.

The *Rules and Schemes of Longitude* by the same *Conductor-General* and his *Aids de Camp*, for executing that *high Office*, in discovering the *Longitude*, (*— Palmaque nobilis — evitata Rotis — evehit ad Deos*), — are all truer in *Theory* than in *Practice*.

PALLADIUM-AUTHOR.

§ The *Age of the Moon* at the Beginning of the Year is the *Epa*. The Number of Days, between *March* the 21st to *Easter-Sunday*, is called by some the *Number of Direction*. — See the *Chronological Rules and Chronicle* farther on.

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THE Rev. Mr. *Piper*, Non F. R. S. formerly wearing a *Silver-Call*, when *Boatswain of the Sea Horse*, having lately taken his *Degree* as a *Metaphysical Parson*, with his utmost Pains and Attention has lately discovered the *Philosopher's Stone*, for turning all *metallic Substances* into *Gold*; which he entirely performs, to general Satisfaction, by his *alchemical Processes and elaborate Operations*.

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* * * The printed and written *LIBEL* extraordinary, signed Non A. R. and the extraordinary *LIBEL*, signed *Libby Butcher*, were both received.

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* * * Our Correspondents, in general, are desired to send all their Letters and Productions before the End of May, (*franked or Post-paid*); the sooner they send the more they can be obliged; directed to the *Palladium-Author*, at Mr. *Cole's*, *Mathematical-Instrument-Maker*, in *Fleet-street*, *London*.

A NEW GUIDE to the YEAR 1772.

P A R T I.

To find the Day of the Month from the Day of the Week, and Day of the Week from the Month-Day.

Against each Month of the Year, to the Right-hand, stand the Seven Week-Days, above which stand all the Month-Days in that Month, answering to each Week-Day.

Contrarily. Under any Month-Day stands the Week-Day against that Month, at the Angle of Meeting.

MONTHS of the YEAR.			MONTH DAYS and WEEK DAYS.						
January.	April.	July.	We	Th	Fr	Sa	Su	Mo	Tu
February.	August.		Sa	Su	Mo	Tu	We	Th	Fr
March.	November.		Su	Mo	Tu	We	Th	Fr	Sa
	May.		Fr	Sa	Su	Mo	Tu	We	Th
	June.		Mo	Tu	We	Th	Fr	Sa	Su
September.	December.		Tu	We	Th	Fr	Sa	Su	Mo
	October.		Th	Fr	Sa	Su	Mo	Tu	We

For Construction of the above Table, see P. 2, Palladium, 1763.

EXAMPLE I. To find the Day of the Month answering to the third Thursday in July, 1772.

To the Right-hand of July you find Th, or Thursday; directly above which, in the Columns among the Month-Days, stand 2, 9, 16, 23, and 30, answering to all the Thursdays in July: Therefore the third Thursday is the 16th Day, required. So for other like Cases.

EXAMPLE II. To find the Day of the Week on which Christmas-day, or the 25th of December, happens, 1772.

Under 25, the Month-Day, against December, at the Angle where the upper and Side Columns meet, stands Fr, or Friday, required. So for other like Cases.

NOTES for 1772.		Moveable FEASTS.		SUN rises.			
Dom. Let. N.S. ED	Feb. 16. Septuages.	Mths.	1st	11th	21st	Examples.	
O. S. AG	Mar. 4. Ash-Wed.						
Golden Number 6	'8. 1 Sund. Lent		h	m	h	m	Against May
Epact (or D's Age at	Apr. 19. East. Sund.	Jan.	8	57	58	7 45	the Sun rises
Year's Beginning) 25	May 24. Rog. Sund.	Feb.	7	227	66	30	h m
Sun's Cycle 17	28. Ascension	Mar.	6	326	125	52	1st 4 35
Roman Indiction 5	June 7. Whitsunday	April	5	315	114	53	11th 4 20
Æra Jul. Per. 6485	14. Trin. Sund.	May	4	354	204	4	21st 4 4
Olympiads 2547	Nov. 29. Advent Sun.	June	3	513	454	43	Dif. 15 ^m in
Found. Rome 2524		July	3	463	544	4	24 Hours, &
Nabonassar 2518		Aug.	4	204	364	54	16 ^m less for
Hegira 1150		Sep.	5	155	325	54	10 Ds. or 1 ^m 1/2
Gregorian Æra 190	Ember-Days.	Oct.	6	136	336	33	a Day nearly.
	Mar. 11, 13, 14.	Nov.	7	127	307	45	N. B. Sun-
Jul. Per. 1 Yr. more	Jun. 10, 12, 13.	Dec.	7	588	68	8	rising sub.
than by French Acct.	Sep. 16, 18, 19.						from 12h
Nabonassar & Found.	Dec. 16, 18, 19.						gives Sun-
Rome 1 Year less.							setting.

Astronomical MOONS for Greenwich-Observatory, 1772.

New Moon.			First Quarter.			Full Moon.			Last Quarter.		
Mths.	d	h m	d	h m	d	h m	d	h m	d	h m	d
Jan.	4	11 41 A	13	2 55 M	20	10 37 M	27	2 11 M			
Feb.	3	4 58 A	11	10 17 A	18	9 19 A	25	1 21 A			
Mar.	4	11 17 M	12	1 54 A	19	7 2 M	26	2 21 M			
Apr.	3	5 22 M	11	1 17 M	17	4 4 A	24	5 14 A			
May	2	9 44 A	10	9 2 M	17	0 51 M	24	9 30 M			
June	1	11 24 M	8	2 22 A	15	9 51 M	23	2 40 M			
	30	10 19 A									
July	30	7 22 M	7	6 51 A	14	8 10 A	22	8 4 A			
Aug.	28	3 46 A	5	11 54 A	13	8 39 M	21	0 48 A			
Sep.	26	12 22 A	4	6 59 M	11	11 55 A	20	4 1 A			
Oct.	26	9 48 M	3	5 9 A	11	5 26 A	19	5 17 A			
Nov.	24	8 16 A	2	7 6 M	10	11 54 M	18	4 31 M			
Dec.	24	7 58 M	2	1 0 M	10	5 35 M	17	1 55 A			
			31	9 56 A							

N. B. M stands for Morning and A for Afternoon.

Add to the Month-day for the Moon's Age.		New D.	Sun and Moon's Place at New Moon.		Sun enters Signs.	Sub. and add from an to D's Southing for her Rising & Setting.		To find the Tides at London.	
No.	d	s	o	d	s	o	h m	Rule. Add 2 ^h 30 ^m to Time of D's Southg (fr. the Table of her Southing) for Time of High Water required.	
Jan.	25	4	9	14	♈	20	3 0	8 30	Ex. May 20, 1772, D souths, by Tab. follow 20 ^d 2 ^h 51 ^m
Feb.	27	3	10	14	♉	18	4 2	8 15	Add 2 30
Mar.	26	4	11	15	♊	20	5 1	7 15	H.W. 5 m 21
Apr.	27	3	0	14	♋	19	6 0	6 15	Add 5 10
May	27	2	1	13	♌	20	7 11	5 15	L.W. 10 m 31
June	29	1 30	2	11	♍	20	8 10	4 15	at Lond. Bridge.
July	29	0 30	4	8	♎	22	9 0	4 0	N.B. Time of H. & L.W. at Lond. serves for Boats and Vessels bound down & up the R. or fr. ab. & below Bridge, to Lond. respect.
Aug.	1	28	5	6	♏	22	9 20	4 15	Gen. Rule. Add the T. of H.W. at N. and Full D for any Place, accords to a Tide-Tab. to the Time of D's Southg, that Day, for H.W. at that Place.
Sep.	3	26	6	4	♐	22	10 29	5 15	
Oct.	4	26	7	4	♑	22	0 0	6 15	
Nov.	5	24	8	3	♒	21	0 29	7 15	
Dec.	6	24	9	3	♓	21	1 28	8 15	

Here the Day of N. D. and No. added for the following Month make up the Days in the present Month.		Ex. II. Apr. 15 Add No. 27		Reg. D Pl. May 20. D's Age 18 ^d by 13 ^h 27 ^m = 7 ^h 27 ^m	
Exam. Apr. N. D. 3, and May 27, added = 30Ds. in Apr. the present Month. N. D. Au. 28 & Sep. 3 added = 31 Ds. in Au. &c		Abate 30		D's Pl. at N. D add } 1 13	
To find Moon's Age, Ex. 1. Oct. 20 Add No. 4 Moon's Age 24 [Days]		Moon's Age 12 N.B. When Age is above 29 or 30 Ds. sub. 29 or 30, as 1st & 2d Col's make 29 or 30.		D Pl. May } 20, Noon } 9 10	
		To find Sun's Place, Sub. or add Deg. for Ds. bef. or aft. ☉ enters a Sn. for his Place. Required Sun's Place for Oct. 10, 1772. 260c. ☉'s Pl. 7 ^h 4 ^m 16 ^s . & Deg ^s . — 16 100c. ☉'s Pl. 6 18		A near Comput. only	
				To find D's Rising & Setting, May 20, 1772 D m. Pl. fr. ab. 9 ^h 10 ^m Arc ^o corref + 4 ^h 7 D's So. 21 st D. 3m 43 D rises 20 ^d 11 36 Sets 21 ^d 7m 50 N.B. Take the Arc ^o nearest or proprot. to D's Place above.	

N. B. The Festival marked * is preceded by a Vigil or Fast. If any of the Feast-days fall on a Monday, the Vigil or Fast-day must be kept on the Saturday before, and not on the Sunday, which is the greatest of Festivals.

The Days having this Mark, †, against them are Holidays observed at the Exchequer, Stamp-Office, Excise-Office, Custom-House, Bank, East-India, and South-sea House.

At the Custom-House there is no Holiday on Valentine, St. David, Shrove-Tuesday, Easter-Wednesday, St. Swithin, Lammass-day, Fire of London, or Holy-Rood.

††† The Offices are mentioned 'All but such and such,' after †, where no Holidays are kept, when they are kept in all the other Offices.

JANUARY, XXXI DAYS.

- 1 Circumcision. †
- 4 Sir Isaac Newton b. 1643, N.S.
- 5 1 Sunday after Circumcision.
- 6 Epiphany, or Twelfth day. †
All but South-sea House.
- 8 Lucian.
- 12 1 Sunday after Epiphany.
- 13 Hilary Cam. Term begins.
- 14 Oxford Term begins.
- 15 Exchequer opens.
- 17 Old Twelfth-day.
- 18 Prisca, Q. Cha. Birth-day kept. †
Russians at Portsmouth, on Friday, 1771. See the Chronicle.
- 19 2 Sunday after Epiph.
- 20 Fabian. 1 Return.
- 21 Agnes.
- 22 Vincent.
- 23 Hilary Term begins.
- 25 Conversion of St. Paul. †
- 26 3 Sunday after Epiphany.
- 27 2 Return.
- 30 K. Charles I. beheaded 1648-9,
O. S. 12 Minutes past One. †

FEBRUARY, XXIX DAYS.

- 2 4 Sunday after Epiphany.
Purific. B. V. or Candlemas. †
- 3 Bishop Blaize. 3 Return.
- 5 Agatha.
- 9 5 Sunday after Epiphany.
- 10 4 Return.
Dies scholastica at Oxford.
- 12 Hilary Term ends.
- 13 Old Candlemas-day.
- 14 Valentine. † All but Stamp,
Custom, and South-sea House.
- 16 Septuagesima Sunday.
- 23 Sexagesima Sunday.
- 24 St. Matthias.*†
- 28 Hare-hunting goes out.

MARCH, XXXI DAYS.

- 1 Quinquagesima, or Shrove-Sund.
St. David. Anniversary-Meeting of the Welch Society, who wear a Leek on this Day in Memory of a famous Victory gained over the Saxons. † All but the Stamp and Custom-H.
- 2 Chad. B. Shrove-Monday.
- 3 Shrove-Tuesday. †
All but the Custom-House.
- 4 Ash-Wed. 1st Day in Lent. †
- 5 Cambridge Commencement for
B. A. Day after Ash-Wednes.
Princess Mary of Hesse b. 1722.
- 7 Perpet. Maudrit.
- 8 1 Sunday in Lent.
- 11, 13, 14, Ember-days.
- 12 Gregory Mart.
- 15 2 Sunday in Lent.
- 17 St. Patrick, Bishop of Ireland.
- 18 Edward, K. of the W. Saxons.
- 19 Joseph.
- 20 Cuthbert. Equal Day and Night.
- 21 St. Benedict.
- 22 3 Sunday in Lent.
- 25 Annunciation of the V. Mary.*
LADY-DAY, 1st Quarter-D. †
- 29 4 Sunday in Lent, or Midlent-Su.
- 31 Russians at Portsmouth, on Friday, 1769. See the Chronicle.
Sir I. Newton died, 1727, N.S.
- APRIL, XXX DAYS.
- 1 Fool's-Cap Day; Hatton-Harry,
Exeter Jack, Leonard Libel,
Mr. O Fagon, &c.
- 3 Richard, B. of Chichester.
- 4 St. Ambrose.
Cambridge latter Act, Thursday after the 4th Sunday in Lent.
- 5 5 Sunday in Lent. Old Lady-day.
- 10 Cambridge Term ends.

- 11 Oxford Term ends.
 12 6th Sunday in Lent, Palm-Sund.
 15 Sun and Clocks together.
 16 Maundy-Thursd.
 17 Good-Friday. †
 19 EASTER-SUNDAY. Alphege.
 20 Easter-Monday. †
 21 Easter-Tuesday. †
 22 Easter-Wed. † All but Custom-h.
 23 St. George. †
 25 St. Mark. †
 16 1 Sund. after Easter. Low-Sund.
 27 Victoi. of Culloden.
 29 Oxford and Camb. Terms begin
 Wednesday after Low-Sunday.
 MAY, XXXI DAYS.
 1 St. Philip and St. James. †
 3 2 Sunday after Easter.
 Invention of the Cross.
 4 1 Return.
 6 St. John ante Port. Lat.
 Easter Term begins.
 10 3 Sunday after Easter.
 11 2 Return.
 12 Old May-day.
 17 4 Sunday after Easter.
 18 3 Return. Westminster Election
 Day after 4th Sun. after Easter.
 19 Dunstan. Q. Charlotte b. 1744.
 24 5 Sun. aft. Easter, Rogation-Sun.
 25, 26, 27, Rogation-days. 4 Ret.
 26 Augustine, 1st Abp. of Cant.
 No Night, but all Twilight.
 27 Venerable Bede.
 28 Ascension-day, or Holy Thurs. †
 All but the South-sea House.
 29 King Charles II.'s Nativity and
 Rest. after 12 Yrs Exile. 5 Ret.
 31 Sun. aft. Ascension, or 6 S. af. East.
 JUNE, XXX DAYS.
 1 Nicomedes, Easter Term ends.
 4 King George III. born 1738. †
 Oxford Term ends.
 5 Boniface.
 7 WHIT-SUNDAY.
 8 Whit-Monday. †
 9 Whit-Tuesday. †
 10 Princess Amelia b. 1711. † All
 but Excheq. and Custom-house.
 Whit-Wednesday. † All but
 the Custom-house.
 10, 12, 13, Ember-days.
 11 St. Barnabas. †
 14 Trinity-Sunday.
 15 1 Return.
 16 Sun and Clocks together.
 17 St. Alban. Oxf. Term begins.
 19 Trinity Term begins.
 20 Transl. of Edw. K. W. Saxons.
 21 1 Sunday after Trinity.
 22 2 Return. Long-ft Day.
 Trinity Colloge Election.
 24 ST. JOHN BAPTIST. † 2d
 Quarter-day. Ox. & Cam. T. beg.
 25 St. John's Colloge Election.
 28 2 Sunday after Trinity.
 29 St. Peter and Paul. † 3 Return.
 30 Buck-hunting comes in & con-
 tinues till Holy-rood. Exeter &
 Wadham Col. Elect. at Oxf.
 JULY, XXXI DAYS.
 2 Visitation of the B. V. Marys.
 3 Dies Comitiorum.
 4 Translat. of St. Martin, Bishop.
 5 3 Sun. after Trin. Old Midsum. d.
 6 4 Return.
 7 Cambridge Commencement for
 B. A. 1st Tuesday in July.
 Tho. à Becket, Church Tyrant.
 8 Trinity Term ends.
 10 Cambridge Term ends.
 12 4 Sunday after Trinity.
 14 Oxford Act, 7 Days from Cam-
 bridge Commencement.
 15 St. Swithin. † All but Stamp,
 Custom, and South-sea House.
 19 5 Sunday after Trinity.
 20 Margaret, Virgin and Martyr.
 22 Mary Magdalen.
 Q. of Denmark born 1751. †
 24 Magdalen College Election.
 25 St. James * †
 26 6 S. af. Trin. Ann. Mother BVM.
 27 Portsmouth-Dock fired at 4 in
 Morn. 1770, since which Union-
 Street was suddenly deserted by an
 Erostratus seeking his Reward.
 30 Dog-days begin. Canicula rises
 with the Sun.
 AUGUST, XXXI DAYS.
 1 Lammas Day. †
 2 7 Sunday after Trinity.
 4 Crown-Point in America taken
 by General Amherst, 1759.
 6 Transfiguration.
 7 Name of Jesus.
 9 8 Sunday after Trinity.
 10 St. Laurence.
 11 Princess of Brunswick b. 1737. †
 All but Cust. and S. S. H.
 12 Old

12 Old Lammas-day.
Prince of Wales born 1762. †

15 Assumption.

16 9th *af. Trin.* Bp of Osnaburgh b. 1763

21 Athanasius. Pr. Wm b. 1765.

23 10 *Sunday after Trinity.*

24 St. Bartholomew. †

28 St. Augustine.

29 Beheading of St. John Baptist.

30 11 *Sunday after Trinity.*

Sun and Clocks together.

SEPTEMBER, XXX DAYS.

1 St. Giles.

2 London burnt, 1666, O. S. †

6 12 *Sunday after Trinity.*

8 Nativity of the B. V. Mary.

9 Dog-days end. Canis Major rises at 3 in the Morning.

13 13 *Sunday after Trinity.*

14 Holy-Cross Day. † All but Sta. Custom and South-sea House.

16, 18, 19, Ember-days.

17 Lambert B.

18 City of Quebec surrendered to General Townshend, 1759.

K. George I. and II. landed. † All but at the Custom-house.

20 14 *Sunday after Trinity.*

21 St. Matthew. †

22 K. Geo. III. and Q. Charl. Cor. 1761. † Equal Day and Night.

26 St. Cyprian.

27 15 *Sunday after Trinity.*

28 Sheriffs of London sworn.

St. MICHAEL, third Quarter-day. † Hare-hunting comes in and lasts till the End of Feb. Princess Charlotte b. 1766.

30 St. Jerome.

OCTOBER, XXXI DAYS.

1 Remigius, Bishop of Rhemes.

4 16 *Sunday after Trinity.*

6 St. Faith.

9 St. Dennis.

10 Old Michaelmas-day. Oxford and Cambridge Terms begin.

11 17 *Sunday after Trinity.*

13 Transl. of K. Edw, Confessor.

17 Etheldred V.

18 18 *Sun. after Trin.* St. Luke. †

19 St. Fridelwide, a Festiv. at Court.

25 19th *af. Trin.* Geo. III. Access. †

26 St. Crispin. Geo. III. proclaimed, 1760. † All but the Stamp, Excise, Custom and S. S. H.

28 St. Simon and Jude. †

NOVEMBER, XXX DAYS.

1 20 *Sun. after Trin.* All Saints. †

2 All Souls. † All but the Stamp, Custom and South-sea House.

3 1 Return. All-Souls Col. Elect.

4 K. William b. 1605, O. S.

5 Gun-Powder Treason. †

6 Leonard. Mich. Term begins.

7 Duke of Cumberland b. 1745.

8 21 *Sunday after Trinity.*

9 Lord-Mayor's Day, London. † All but the Exchequer.

11 St. Martin.

12 2 Return.

13 Britius, Bishop.

15 22 *Sund. after Trin.* Machutus.

17 Hugh Bp Lincoln. Anniv. Q. Eliz. Procl. † All but Cust. & S. S. H.

18 3 Return.

20 Edmund, King and Martyr.

22 23 *Sunday after Trinity.*

Cecilia. Old Martinmas-day.

23 St. Clement.

25 St. Catherine. 4 Return.

D. of Gloucester born 1743. † Balliol College Election Thursday before St. Andrew.

28 Michaelmas Term ends.

29 *Advent Sunday.*

30 St. Andrew. † Princess Dowager of Wales born 1719. †

DECEMBER, XXXI DAYS.

4 Barbary.

6 2 *Sunday in Advent.*

8 Conception of the B. V. M.

13 3 *Sunday in Advent.* Lucy.

16 O Sapientia. Camb. Term ends.

16, 18, 19, Ember-days.

17 Oxford Term ends.

20 4 *Sunday in Advent.*

21 St. Thomas. †

22 Shortest Day.

23 Sun and Clocks together.

25 CHRISTMAS-DAY, 4th Quarter-Day. Fox-hunting comes in and lasts till Lady-day.

26 St. Stephen. †

27 1 *Sunday after Christmas.*

St. John the Evangelist. †

28 Holy Innocents.

31 Silvester, Bishop of Rome.

A TABLE of the Moon's Southings, or Times when she passes the Meridian of Greenwich Observatory, for the Year 1772. For the Use of Seamen, in finding the Time of Tides, &c.

D.	Jan. h m	Feb. h m	Mar. h m	Apr. h m	May h m	June. h m	July. h m	Aug. h m	Sept. h m	Oct. h m	Nov. h m	Dec. h m
1	8m 54	10m 10	9m 45	10m 44	10m 56	0a 3	0a 30	1a 54	3a 28	4a 17	5a 17	5a 55
2	9 47	10 58	10 29	11 27	11 43	0 55	1 24	2 48	4 24	5 13	6 36	6 37
3	10 41	11 44	11 13	0a 9	0a 31	1 48	2 18	3 41	5 19	6 7	7 21	7 20
4	11 33	0a 29	11 56	0 54	1 20	2 43	3 11	4 35	6 16	6 59	8 5	8 2
5	0a 23	1 12	0a 38	1 40	2 10	3 36	4 3	5 30	7 11	7 48	8 47	8 45
6	1 11	1 54	1 20	2 28	3 2	4 29	4 54	6 22	8 3	8 25	9 30	9 29
7	1 55	2 35	2 3	3 16	3 54	5 20	5 47	7 18	8 53	9 20	10 12	10 14
8	2 41	3 18	2 48	4 9	4 48	6 11	6 39	8 13	9 41	10 2	10 55	11 1
9	3 22	4 2	3 34	5 1	5 40	7 2	7 32	9 7	10 28	10 46	11 40	11 49
10	4 5	4 47	4 22	5 55	6 31	7 55	8 29	9 59	11 12	11 28	Morn	Morn
11	4 44	5 33	5 12	6 48	7 25	8 48	9 24	10 49	11 56	Morn	0 26	0 40
12	5 28	6 24	6 5	7 42	8 18	9 44	10 18	11 37	Morn	0 12	1 15	1 31
13	6 13	7 16	6 59	8 36	9 10	10 41	11 12	Morn	0 39	0 56	2 4	2 22
14	6 58	8 11	7 54	9 30	10 6	11 37	Morn	0 23	1 22	1 41	2 53	3 13
15	7 48	9 8	8 51	10 25	11 3	Morn	0 4	1 7	2 5	2 28	3 44	4 1
16	8 39	10 5	9 47	11 21	12 0	0 33	0 54	1 51	2 50	3 16	4 35	4 53
17	9 35	11 4	10 43	Morn	Morn	1 27	1 41	2 33	3 33	4 6	5 25	5 43
18	10 31	12 0	11 39	0 19	0 58	2 18	2 26	3 16	4 23	4 56	6 16	6 34
19	11 30	Morn	Morn	1 17	1 55	3 7	3 10	4 0	5 13	5 48	7 7	7 26
20	Morn	0 56	0 36	2 15	2 51	3 53	3 52	4 45	6 3	6 40	7 58	8 19
21	0 27	1 51	1 33	3 13	3 43	4 36	4 35	5 32	6 55	7 32	8 51	9 16
22	1 23	2 46	2 30	4 8	4 33	5 19	5 18	6 19	7 49	8 26	9 46	10 12
23	2 18	3 41	3 27	5 1	5 20	6 1	6 2	7 11	8 43	9 17	10 43	11 11
24	3 12	4 36	4 24	5 50	6 4	6 43	6 48	8 4	9 38	10 13	11 42	0a 9
25	4 4	5 31	5 18	6 37	6 46	7 27	7 36	8 59	10 33	11 9	0a 42	1 5
26	4 57	6 25	6 11	7 23	7 29	8 12	8 27	9 54	11 29	0a 7	1 41	1 58
27	5 49	7 17	7 2	8 7	8 10	8 59	9 20	10 50	0a 25	1 6	2 38	2 48
28	6 42	8 9	7 49	8 49	8 53	9 47	10 14	11 46	1 23	2 7	3 32	3 35
29	7 35	8 57	8 35	9 31	9 37	10 41	11 23	0a 41	2 21	3 5	4 23	4 20
30	8 28		9 19	10 14	10 24	11 35	0a 5	1 37	3 19	4 2	5 10	5 4
31	9 20		10 2		11 13		1 0	2 32		5 0		5 46

To find Time of H. Water, on any Day of the Month, at any given Place, for 1772.

Gen. Rule. To the Time of the Moon's Southing (fr. the above Tab.) for that Day, add the Time of H. W. at N. and F. Moon in the given Place (fr. Tide-Tab. p. 105, 106, Pal. 1765, or any other Tide-T.) and the Sum, abating 12, when above 12^h will be T. of H. W.

Example. To find the Time of High Water, at London, on May 1, 1772.

From the above Table, the Moon souths, at London, on that Day, 10^h 56^m Morn. To which add the constant Time of High Water at New and Full, Lond. 2 30

Time of High Water, May 1, at London, 1 26 A. req.

Add for next Low Water, 5 30

Low Water at London, May 1, 6 56 A.

N. B. Time of H. W. serves for Boats & Vessels bound to Places below Bridge, fr. Lond. and Time of Low Water serves for Boats & Vessels bound to Places above Bridge, fr. Lond.

* * * Seamen may determine the Time of H. & L. W. at all Places by the foregoing Gen. Rule, fr. the above Tab. and the constant Time of H. W. at N. & F. Moon, at each Place, fr. a Tide-Table. The above Table is also of Use for finding the Moon's near Time of Rising and Setting, from her mean Place, and Semi-duration Arc, for any Place.

THE BRITISH PALLADIUM, OR

TABLE of the Eclipses of the first SATELLITE of JUPITER, for Gr. Obs. 1772.
For finding the Difference of Longitude, by Sea or Land.

January.	February	March.	April.	May.	June.
		Immerf.	Immerf.	Immerf.	Immerf.
On this Mth. being so near the Eclip. of his Sat. can not be seen. The *is plac'd against the visible Eclipses of the first Sat. of Υ for Greenwich. N.B. When the Time at the Ship is later than that at Greenwich, the Longitude is East; if sooner, West of Greenw.	<i>Jupiter's</i> Satellites are invis- ible this Month al- to, by be- ing too near the Sun.	D. h m s 2 12 13 20 4 6 42 26 6 1 11 15 7 19 40 20 9 14 9 10 11 8 38 11 13 3 7 5 14 22 36 15 16 16 5 18 18 10 34 10 20 5 3 15 21 23 32 11 23 18 1 12 25 12 30 17 27 6 59 5 29 1 28 9 30 19 57 15	D. h m s 1 14 26 1 3 18 55 2 5 3 23 56 6 21 52 55 8 16 21 48 10 10 50 45 12 5 19 36 13 23 48 21 15 18 17 19 17 12 46 10 19 7 14 51 21 1 43 40 22 12 28 24 14 41 11 26 9 9 49 28 3 38 30 29 22 7 53	D. h m s 1 16 35 45 3 11 4 15 5 5 32 49 7 0 1 17 8 18 29 42 10 12 58 10 12 7 26 35 14 1 54 56 15 20 23 19 17 14 51 40 19 9 19 55 21 3 48 9 22 16 27 23 24 16 44 35 26 11 12 50 28 5 40 51 30 0 8 51 31 18 37 0	D. h m s 2 13 5 15 4 7 33 8 6 2 1 15 7 20 29 18 9 14 57 18 11 9 25 25 13 3 53 29 14 22 21 30 16 16 49 35 18 11 17 33 20 5 45 35 22 0 13 30 23 18 41 30 25 13 9 39 27 7 37 40 29 2 5 46 30 20 33 47

July.	August.	Septemb.	October.	Novemb.	Decemb.
Immerf.	Immerf.	Emerfion.	Emerfions	Emerfions	Emerfions
D. h m s 1 15 1 46 2 19 29 55 4 3 58 0 6 22 26 10 8 16 54 20 10 11 22 37 12 5 50 51 14 0 19 8 16 18 47 25 18 13 15 51 20 7 44 17 22 2 12 43 24 20 41 13 26 15 9 39 28 9 38 13 30 4 6 45 31 22 35 27	1 17 4 7 3 11 42 40 5 6 1 21 7 0 30 13 9 18 59 0 11 13 27 5 13 7 56 45 15 2 25 47 17 20 54 39 19 15 23 37 Emerfions 21 12 8 14 23 6 37 17 25 1 6 19 27 19 35 30 29 14 4 45 31 8 33 55 3 3 3 10 5 21 32 17	D. h m s 1 16 1 34 3 10 30 55 5 5 0 9 7 23 29 29 9 17 58 50 11 12 28 17 13 6 57 35 15 1 27 0 17 19 56 21 19 14 25 52 21 8 55 19 23 3 24 36 25 21 54 7 27 16 23 31 29 10 52 59 31 5 22 25	D. h m s 1 18 21 10 3 12 50 40 5 7 20 5 7 1 49 19 9 20 18 50 11 14 48 10 13 9 17 29 15 3 46 47 17 22 15 54 19 16 45 9 21 11 14 20 23 5 43 30 25 0 32 40 27 18 41 46 29 13 10 49 31 7 39 55 3 2 8 54	D. h m s 1 20 37 57 3 15 6 57 5 9 35 49 7 4 4 40 9 22 33 31 11 17 2 11 13 10 57 12 15 5 59 31 17 0 28 15 19 18 56 54 21 13 25 30 23 7 53 48 25 2 22 28 27 20 50 50 29 15 19 17 31 9 47 39 3 4 15 59	D. h m s 1 22 44 15 3 17 12 31 5 11 40 47 7 6 8 52 9 0 37 1 11 19 5 25 13 13 33 27 15 8 1 40 17 2 29 41 19 20 57 51 21 15 25 57 23 9 53 51 25 4 22 6 27 22 50 7 29 17 18 16 31 11 46 26 3 6 14 19

To find the Difference of Longitude from Greenwich Observatory.

Rule. The Difference of Time between any Eclipse of Jupiter's first Satellite, at Greenwich, happening as above, and the Time the same Eclipse is observed to happen under a distant Meridian, being turned into Degrees, at Sea or Land, will be the Difference of Longitude between Greenwich and the Place of Observation.

Example. Eclipse of 1st Satellite of Jupiter at Greenwich, Apr. 1^d 14^h 26^m 1^s.
The same being observed at Sea, or a distant Port, sooner, 1 9 17 10

Hence, Dif. Long. to the West of Greenwich, is 77° 12' 45", req. Dif. 5 8 51

Three ECLIPSES of the SUN, and Two of the MOON, for 1772.

I. Of the SUN: Invisible in England. April 3^d. Morning. True Conjunction 5^h. 23^m. 31^s. and Latitude of the Moon $10^{\circ} 21' 41''$. On a small Part of the Sun's superior Limb it will be seen in Holland and Germany. The two Limbs of the Sun and Moon are seen to touch at Sun-rise, in 50° Latitude, and 28° Longitude, from Paris. It may be seen at Prague, Cracow, and Moscow. — This Eclipse is unnoticed by the present Astronomer Royal of Greenwich, who is Conductor-General of the Nautical Ephemeris, for finding the Longitude.

II. Of the MOON, visible, April 17, in the Evening.

Beginning $2^{\text{h}} 20^{\text{m}} 8^{\text{s}}$ A.	According to the Nautical Ephemeris.	Beginning - - - - - $2^{\text{h}} 17^{\text{m}} \frac{1}{2}$
Immersion 3 17 29		Beginning of total Darkness 3 14 $\frac{1}{2}$
Emerſion 4 56 41		Middle - - - - - 4 4 $\frac{1}{2}$
End - - 5 53 52		End of total Darkness - - 4 54 $\frac{1}{2}$
Digits - $21^{\circ} 3'$ on the		End of the Eclipse - - - 5 53
Southern Part: Seen in the North-East of Europe.		Digits eclipsed - - - - - $21^{\circ} 18'$

III. Of the SUN, invisible, September 26^d $12^{\text{h}} 23^{\text{m}}$, in $40^{\circ} 24'$ of Libra. Moon's Latitude $10^{\circ} 24' \frac{1}{2}$ South. Visible only in Places near the South Pole. This only according to the Nautical Ephemeris. To be examined.

IV. Of the MOON, partly visible, October 11, in the Evening.

Beginning $3^{\text{h}} 30^{\text{m}} 50^{\text{s}}$	According to the Nautical Ephemeris.	Beginning - - - - - $3^{\text{h}} 29^{\text{m}}$
Immersion 4 36 27		Beginning of total Darkness - 4 35
Moon rises 5 17 40		Middle - - - - - 5 27
Opposition 5 27 10		Moon rises at Greenwich - - 5 28
Emerſion 6 20 19		End of total Darkness - - - 6 19
End - - 7 25 46		End of Eclipse - - - - - 7 25
Digits - $19^{\circ} 43'$ in the North Part.		Digits - - - - - $19^{\circ} 46'$

V. Of the SUN, visible, October 26, Morning, at $9^{\text{h}} 49^{\text{m}} 30^{\text{s}}$, Latitude of the Moon $10^{\circ} 15' 7''$ N. At $8^{\text{h}} 36^{\text{m}}$ the Limbs of the Sun and Moon are seen about $45''$ distant. The North Limb of the Sun and South Limb of the Moon touch, at Sun-rise, at 1st Meridian, and at $54^{\circ} \frac{1}{2}$ Lat. N. Seen at Dublin, Dover, to the North of Amiens, South of St. Quintin, and North of Venice.

According to the Nautical Ephemeris.	Beginning $8^{\text{h}} 23^{\text{m}}$	
	Greatest Obscuration 8 31	{ Digits $00^{\circ} 6' \frac{1}{2}$
	End 8 39	

A COMPARISON of some Lunations, according to the British Nautical Ephemeris, conducted by Mr. Maskelyne, and the French Connoissance des Temps, (reduced to the Meridian of Greenwich), conducted by Mr. de la Lande.

Jan. 27 ^d $2^{\text{h}} 12^{\text{m}}$	M. Nautical Ephemeris.	}{ Last Quarter.
26	M. Con. des Temps.	}{ Dif. 14 m. — Naut.
Feb. 11 10 17	A. Nautical Ephemeris.	}{ First Quarter.
2	A. Con. des Temps.	}{ Dif. 15 m. + Naut.
Mar. 26 2 22	M. Nautical Ephemeris.	}{ Last Quarter.
36	M. Con. des Temps.	}{ Dif. 14 m. — Naut.
Aug. 28 3 45	A. Nautical Ephemeris.	}{ New Moon.
4 3	A. Con. des Temps.	}{ Dif. 18 m. — Naut.
Nov. 10 11 54	A. Nautical Ephemeris.	}{ Full Moon.
0 1	A. Con. des Temps.	}{ Dif. 11 ^h 53 ^m + Naut.

Quote the
Cause of so
great a Difference.

N. B. The nearest Numbers to Truth may be discovered by a Computation from the lunar Tables and Equations in the improved R. Afr. or from the Durham Tab. but more readily by a general Comparison with other annual Computations.

CHRONOLOGICAL TABLES and RULES for finding the Dominical Letter for ever, either according to Old or New Style; the Day of the Week to any Day of the Month; the Time of Easter, and moveable Feasts, for any Year past or to come; the Golden Numbers and Epact according to both Styles; Time of New, Full, and Quarter Moons; Time of Tides, or high and low Water, &c.

A perpetual

THE BRITISH PALLADIUM, OR

Actual DOMINICAL-LETTER TABLE, for shewing the Dominical Letter, for any Year, past or to come, for ever, according to O. d. Style. Demonstrating to Mr. Maskelyne, Astronomer Royal, and all the World, that Mr. Mayer's astronomical Tables, published by him, for the Commissioners of Longitude, are not true in their Chronology, of 100, 200, 300, &c. Years, before Christ, being represented for Leap or Bissextile Years, which should be 1, 101, 201, 301, &c.

Dominical Letters before Christ.							YEARS above Centuries, before and since CHRIST. Old Style.	Dominical Letters since Christ.							
CENTURIES before Christ.								CENTURIES since Christ.							
2000	1900	1800	1700	1600	1500	1400		1300	1200	1100	1000	900	800	700	
D	E	F	G	A	B		DC	ED	FE	GF	AG	BA	CB		
FE	GF	AG	BA	CB	DC		B	C	D	E	F	G	A		
G	A	B	C	D	E		A	B	C	D	E	F	G		
A	B	C	D	E	F		G	A	B	C	D	E	F		
B	C	D	E	F	G		FE	GF	AG	BA	CB	DC	ED		
DC	ED	FE	GF	AG	BA		D	E	F	G	A	B	C		
E	F	G	A	B	C		C	D	E	F	G	A	B		
F	G	A	B	C	D		B	C	D	E	F	G	A		
G	A	B	C	D	E		AG	BA	CB	DC	ED	FE	GF		
BA	CB	DC	ED	FE	GF		F	G	A	B	C	D	E		
C	D	E	F	G	A		E	F	G	A	B	C	D		
D	E	F	G	A	B		D	E	F	G	A	B	C		
E	F	G	A	B	C		CB	DC	ED	FE	GF	AG	BA		
GF	AG	BA	CB	DC	ED		A	B	C	D	E	F	G		
A	B	C	D	E	F		G	A	B	C	D	E	F		
B	C	D	E	F	G		FE	GF	AG	BA	CB	DC	ED		
ED	FE	GF	AG	BA	CB		C	D	E	F	G	A	B		
F	G	A	B	C	D		B	C	D	E	F	G	A		
G	A	B	C	D	E		A	B	C	D	E	F	G		
CB	DC	ED	FE	GF	AG		GF	AG	BA	CB	DC	ED	FE		
D	E	F	G	A	B		E	F	G	A	B	C	D		
E	F	G	A	B	C		D	E	F	G	A	B	C		
F	G	A	B	C	D		CB	DC	ED	FE	GF	AG	BA		
AG	BA	CB	DC	ED	FE		G	A	B	C	D	E	F		
B	C	D	E	F	G		F	G	A	B	C	D	E		
C	D	E	F	G	A		ED	FE	GF	AG	BA	CB	DC		
D	E	F	G	A	B										

ample. To find the Dominical Letter for the 3^d Year since Christ, the Year of his Crucifixion, O. d. Style.

der 0 Centuries, to the Right, and 33 odd Years, to the Left, stands D, required. ice, by the Week day Table in the next Page, April 3, the Day of Christ's Crucifixion, was a Friday, the 5th being on a Sunday — N. B. The Dominical Letter, for any Date since Christ, will be the same as the Dominical Letter, since Christ, for the Complement of Years, less 1, to any Number of 7 Hundred Years, and the contrary.

A perpetual DOMINICAL-LETTER TABLE, for showing the Dominical Letter, for any Year, past or to come, for ever, according to New Style.

Dom. Letters bef. Chr.				Dom. Letters since Chr.			
Centuries bef. Christ.				Centuries since Christ.			
38.32.36 Hundred.	28.32.36 Hundred.	18.32.36 Hundred.	8.32.36 Hundred.	1.5.9 Hundred.	2.6.10 Hundred.	3.7.11 Hundred.	4.8.12 Hundred.
3.7.11 Hundred.	2.6.10 Hundred.	1.5.9 Hundred.	0.4.8 Hundred.	1.5.9 Hundred.	2.6.10 Hundred.	3.7.11 Hundred.	4.8.12 Hundred.
YEARS above Centuries, before and since CHRIST. New Style.							
G	B	D	F	C	E	G	BA
BA	C	E	G	B	D	F	G
C	D	F	A	A	C	E	F
D	E	G	B	G	B	D	E
E	F	A	C	FE	AG	CB	DC
GF	AG	CB	ED	D	F	A	B
A	B	C	D	C	E	G	A
B	C	D	E	B	D	F	G
C	D	E	F	AG	CB	ED	FE
ED	FE	AG	CB	F	A	C	D
F	G	A	B	E	G	B	C
G	A	B	C	D	F	A	B
CB	DC	FE	AG	CB	ED	GF	AG
D	E	F	G	A	C	E	F
E	F	G	A	B	D	F	E
AG	BA	DC	FE	ED	AG	CB	BA
B	C	D	E	C	E	G	A
C	D	E	F	B	D	F	G
D	E	F	G	A	C	E	F
FE	GF	BA	DC	GF	BA	DC	ED
G	A	B	C	E	G	B	C
A	B	C	D	D	F	A	B
B	C	D	E	C	E	G	A
DC	ED	GF	BA	BA	DC	FE	AG
E	F	G	A	G	B	D	E
F	G	A	B	F	A	C	D
G	A	B	C	E	G	B	C

Ex. To find the Dom. Letters answering to the 365th Year bef. Ch. N.S.—Under 3 Centuries, or 300, to the Left, and against 65 odd Years to the Right, stand FE, required.

N. B. By Construction, the Dom. Let. for any No. of Yrs bef. Ch. will be the same as the Dom. Let. since Ch. for the Complement of those Years, less 1, to any No. of 400 Years, and the contrary. — Ex. Dom. Let. B, bef. Chr. 1934 — 1 = 1933 — 3600 (9 Times 400) = 1667, Complement, since Christ, Dominical Letter B.

WEEK and MONTH DAY TABLE; showing, by the Dominical Letter, of either Style, the Day of the Week to any Day of the Month, and the contrary, for ever.

Mnth.	Sunday or Dom. Letters.						
	A	B	C	D	E	F	G
Jan. 31	1	2	3	4	5	6	7
Oct. 31	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31	1	2	3	4
Feb. 28	5	6	7	8	9	10	11
Mar. 31	12	13	14	15	16	17	18
Nov. 30	19	20	21	22	23	24	25
	26	27	28	29	30	31	1
Apr. 30	2	3	4	5	6	7	8
	9	10	11	12	13	14	15
July 31	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30	31	1	2	3	4	5
	6	7	8	9	10	11	12
Aug. 31	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	31	1	2
Sep. 30	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
Dec. 31	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	31	1	2	3	4	5	6
	7	8	9	10	11	12	13
May 31	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	31	1	2	3
	4	5	6	7	8	9	10
June 30	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	1

Example. To find the Week Day to May 28, 585 Years before Christ, Old Style.

By the 1st Table, the Dominical Letters are FE, being Bissextile. Under E, against May, stand 4, 11, 18, 25, &c. the Sundays; consequently, the 28th of May, 585, before Christ, was on a Wednesday when the Battle was fought, and Peace ensued, between the Medes and Lydians.

* * Thus both Old and New Styles may be *correctly* carried backward or forward, as far as any one pleases, the same as if they had really existed.

To find the Difference of Days, more, between New and Old Style, for any Date before Christ.

DATES BEFORE CHRIST.

RULE I. From the *Hundreds*, less 1, take their *Fourth*; and add 2; These Days add to New Style, the Old one will shew.

Years.

Example. Hundreds 23 | 50 before Christ.
Subtract 1

22 remain.

Subtract the Fourth, 5 neglecting the Remainder,

17 remain.

Add 2

Difference of Days 19 add to *New Style* for *Old*, at that Time;
So for all other Dates before Christ.

To find the Golden Number (or Prime), Sun's Cycle, and Roman Indiction; for any Year before Christ.

RULE II. Add to the Date, 17, 18, 11;

Divide by 19, 4 Sevens, 8, and 7;

Remainders take from these — then all are given.

Examples. Ref. Chr. 397
17

397
18

397
11

19)414(2

Take 15 Rem,
From 19

28)415(14

Take 23 Rem.
From 18

15)408(27

Take 3 Remainder
From 15, or 8 and 7.

Golden Number 4 Sun's Cycle 5 Indiction 12 Remainders.

N. B. When 0 remains after *Subtraction*, the *Golden Number*, *Sun's Cycle*, and *Indiction*, are, respectively, 19, 28, and 15.

When 17, 18, or 11, is added to the Date, if the Sum be less than 19, 28, or 15, subtract from those Numbers, respectively, and the *Remainder* will be the *Golden Number*, *Sun's Cycle*, or *Indiction*, respectively.

To find the Difference of Days, less, between New and Old Style, for any Date since Christ.

DATES SINCE CHRIST.

RULE III. From the *Hundreds*, their *Fourth*, and more 2, you must take; These Days take from *New Style*, the *Old* one will make.

Years.

Example. Hundreds 17 | 72 since Christ.
2 more a Fourth, 6 subtract.

Difference of Days 11 remain; subtract from the *New Style* for the *Old*.

So for all other Dates since Christ.

Rule for New Moon. When the *Moon's Age* is more than the *Day of the Month*, subtract it from 30, and add the Remainder to the *Day of the Month*, for *New Moon*, as above.

Or subtract the *Sum* of the *Month-day* and *Epa* from 30 (or 60) for the *Day of New Moon*.

When the *Moon's Age* is less than the *Month-day*, subtract it therefrom, for the *Day of New Moon*, as above.

N. B. The above Rule gives the *Moon's Age*, or *New Moon*, but within a Day; because of the *Moon's irregular Motion*, and *Month's unequal Number of Days*, not agreeing with what are here reckoned equal; and the *Months*, from *March*, 31 and 30, alternately, breaking the Succession, at *August 31* (instead of 30), *November 30* (instead of 31), by *Augustus Caesar's* altering what *Julius Caesar* had wisely established; there is the following Rule for the following Numbers to be added, for the several Months, to the *Month-day* and *Epa*, for the *Moon's Age*; as the *Moon's Age* is 29 and 30 Days, one Month with another, from *March*.

January 0, February 2, March 1, April 2, May 3,

June 4, July 5, August 6, September 8, agree,

October 3, November 10, December 10 — to *Epa* add —

With Day — bate 30 — *Age*, or *Change*, is had.

But, as the above is but a near Rule, sometimes one Way comes nearest the Truth, and sometimes the other.

This Rule is correctly supplied, by adding so many Days, in each Month, to the *Month-day*, (subtracting 30 when required), in P. 7 of this Year's *Palladium*, for her true *Age*, without farther Trouble; and so for every Year the *Palladium* is published.

To find the *Epa* for any Year since Christ, according to New Style.

RULE VII. From the *Epa* for the Year, O. S. (found as before), subtract 21; first adding 30 (if required), and the Remainder will be the *Epa*, N. S.

Or, which is the same,

Subtract 1 from the *Golden Number*, multiply the Remainder by 11, and divide the Product by 30; the Remainder will be the *Epa* for New Style, from 17 to 1900. After the last Period, the *Epa* alter, according to Tab. Col. 5, P. 168 of the *Royal Astronomer*.

Example. 1772. *Golden Number* 6

— 1

Remainder 5

By 11

90)55(25 *Epa*, N. S.

So that in the Period, 1900, 2000, 2100, 2200, 2300, 2400, &c. Subtract from the *Epa*, O. S. 22 . 22 . 22 . 23 . 24 . 25. &c. for the *Epa*, New Style, according to the following

UNIVERSAL RULE, for finding the *Epa*, New Style, for any Year since Christ, for ever. Which Rule will serve for Years before Christ, by carefully altering the Signs of Addition to Subtraction. Centuries before Christ are denoted by —, instead of +.

— Divide Hundreds by 4, the Remainder thence had

Multiply by 17, and then 86 add;

Forty-three by that Quote must be added beside,

— And then 25 the whole Sum must divide;

Subtract the last Quotient from the Prime by 11,

Rejecting the Thirties, your *Epa* is given.

Example.

ANNUAL MISCELLANY, 1772.

Example. For 1900 since Christ.

Hundreds.

$$\begin{array}{r} 43 \text{ 19 } (\dots 4 \text{ Quote.} \\ \text{Remainder } 3 \text{ By } 43 \\ \text{By } 17 \end{array}$$

$$\begin{array}{r} 172 \\ \text{Add } 51 \\ 172 \end{array}$$

Golden Number 2
 By 11

 11
 Add 30

 41

Subtract 12 last Quote.

25)309(12 last Quote.

EpaE, 1900, New Style, 29

N. B. At 900 before Christ, the *EpaE* for Old and New Style are the same. The Moon's Age, or *EpaE*, advances, (instead of retreats), or the Days Dis. add (instead of subtract) before that Time; that is, the last Quote adds to the *EpaE* of old for that of new Style. — The foregoing is an original, as well as universal, Rule, and carries the New Style into remote Antiquity, or Futurity, the same as if it had always really existed.

To find the near Time of the Moon's Southing, and thence the near Time of High-Tide at London, generally.

RULE VIII. The Moon's Age by 4, if by 5 you divide,
 Will give you her Southing: Add 3 for the Tide.

Example. The Moon's Age 9 Days.

By 4

$$\begin{array}{r} 5)36(7^h 12^m, \text{ past Noon, Time of D's Southing.} \\ \text{Add } 3 \end{array}$$

High Water 10 12 at London.

Or, If you multiply the Moon's Age by Eight-Tenths, it will give you her Southing. — **N. B.** This Rule is correctly supplied by a Table of the Moon's Southing for the Year, at Page 11.

$$\begin{array}{r} 9 \\ \times 8 \\ \hline 72 = 7^h 12^m, \text{ as before.} \\ \text{Add } 3 \end{array}$$

Time of High Water 10 12 at London.

To find Easter Limit, or the Paschal Full Moon, arithmetically, for New Style.

RULE IX. To the *EpaE* add 6, and reject Ten Times Three.
 What remains take from 50, your Limit you'll see;
 If 50 or 49's left, when you've done,
 And the Prime above 11 — Take, for each, left by 5.

Example. For 1772. *EpaE* 25
 Add 6

Golden Number 6

$$\begin{array}{r} 31 \\ \text{Reject } 39 \\ \hline 24 \end{array}$$

$$\begin{array}{r} 49 \text{ Days from March 2 inclusive, Fall of the} \\ \text{March } 31 \text{ —} \\ \text{April 18 the Limit.} \end{array}$$

51

To find Easter-Day, or the Number of Days it falls from the 1st of March, 1700

RULE X. Take the Letter and 4 from the *Limit-Day's* Fall,

From March 1.

Example. For 1772. Limit-Days 49

Subtract 8 —

Dominical Letter D . . 4

Add 4

Rem. 41 —

Letter and 4=8

Six Sevens 42

Rem. 1

Add 18 April, Easter-Limit for Full Moon.

Sum 19 April, 1772, Easter, N. S. required.

TABLE of the Fall of EASTER till 1800.

Year.	Easter.	Year.	Easter.	Year.	Easter.	Year.	Easter.
1773	Apr. 11	1780	Mar. 26	1787	Apr. 8	1794	Apr. 20
74	3	81	Apr. 15	88	Mar. 23	95	5
75	16	82	Mar. 31	89	Apr. 12	96	Mar. 27
76	7	83	Apr. 30	90	4	97	Apr. 16
77	Mar. 3	84	11	91	24	98	8
78	Apr. 19	85	Mar. 27	92	8	99	Mar. 24
79	4	86	Apr. 16	93	Mar. 31	1800	Apr. 13

• • • Easter can never fall sooner than March 22, nor later than April 25.

The *Sundays*, between *Asc. Wednesday* and *Easter*, are called *Sundays in Lent*;

N. B. The Distance of *Easter-Sunday* from *March 21*, is called by some the

See the chronological Tables in our Royal Astronomer, whereby most of these

In using the *Dominical Letter* and *Golden Number* Tables in *R. Afr.* for all Years

N. B. The Dominical-Letter Tables show the Leap-Years, and Years since, at

PRINCIPAL HOLYDAYS, or MOVABLE FEASTS.

SUNDAYS.	Weeks		SUNDAYS.	Weeks
Septuagesima	9		Low-Sunday	1
Sextagesima	8		Rogation	5
Quinquagesima, or			Ascension-Day, or	
Shrove-Sunday	7	Before	Holy-Thursd.,	After
Asb-Wednesday		Easter,	next after Rogation	Easter.
next after			Whit-Sunday	7
Quinquagesima	6		Trinity	8
Palm-Sunday	5			
Good-Friday 2 Days				
before Low-Sunday				

The

• • • The *Dominical-Letter Tables*, for Old and New Style, supply the *Rules* for finding the *Dominical Letters*, according to Old and New Style, in the *shortest and simplest Manner*; as the *Week-Day Table*, at the End of the *Dominical-Letter Table for New Style*, supplies the *Rules*, in the *shortest Manner*, for finding the *Week-day* to any *Month-day*, and the *contrary*, for ever, according to both Styles — Saving Abundance of Trouble to the *chronological Computer*, in the Compass of 1 Page. What is *deficient* here, will be perfectly supplied in **ANOTHER WORK** we propose to publish, for the Use of SEAMEN; as an *Amendment and Improvement* of several Things, for the Use of the **PRACTICAL NAVIGATOR**; whose Ease and Satisfaction we have therein considered to the utmost.

NUMBER I.

AN ALPHABETICAL CHRONICLE of REMARKABLE EVENTS.

According to the surest Authorities.

Primaque ab Origine Mundi

Ad aera perpetuum deducite Tempora Verum.

N. B. *b* stands for before, and *s* since, Christ.

- | | | |
|---|---|---|
| <i>A. Bof. & since Chr.</i> | <i>Æthiopians invade Ægypt, and drown Orus in the Nile</i> <i>b</i> 947 | <i>Alexandria Library, of 700000 Volumes, burnt by Julius Cæsar</i> <i>b</i> 44. |
| <i>Abimelech kills his 70 Brethren, and governs the Jews</i> <i>b</i> 1293 | <i>Agatocles, King of Sicily, massacred the Wives and Children of his Soldiers, for their putting two of his Sons to Death</i> <i>b</i> 307 | <i>Alfred IV. Son of Ethelwolf, born 849, at Wantage in Berks; came to the Crown of England 871; took London from the Danes, besieged Rochester, and drove them to their Ships, 872; founds the University of Oxford, 874; formed a Body of Laws, and died</i> <i>s</i> 900 |
| <i>Abraham, his Calling out of Ur</i> <i>b</i> 1927 | — <i>Crossing the Sea against the Carthaginians, an Eclipse of the Sun then happened, August 15</i> <i>b</i> 316 | — <i>He was succeeded by his Son, Edward the elder.</i> |
| — <i>goes into Ægypt, caused by Famine</i> <i>b</i> 1926 | <i>Agrippa, King of Judea, reigned 74 Years, died</i> <i>b</i> 44 | <i>Alfred, Son of Etheldred II. had his Eyes put out by Earl Godwin, and 600 of his Train murdered at Guilford</i> <i>s</i> 1036 |
| <i>Achilles, Grecian General, died</i> <i>b</i> 3144 | <i>Abab, King of Israel, reigns</i> <i>b</i> 925 | — <i>He died soon after in a Monastery at Ely.</i> |
| <i>Acrisius marries Euridice</i> <i>b</i> 1047 | <i>Abas reigns in Judea</i> <i>b</i> 747 | <i>Alphonfus, King of Spain, freed that Country from the Tribute of 100 Virgins</i> <i>s</i> 793 |
| <i>Abim, Battle of, lost by Anthony</i> <i>b</i> 31 | <i>Ajex, Son of Telamon, flourished</i> <i>b</i> 1149 | <i>Amasis defeats Apres, and reigns in Ægypt</i> <i>b</i> 668 |
| <i>Adam and Eve created, according to Moses, the different Accounts thereof, 4000, 5508, &c</i> <i>b</i> 3956 | <i>Alciades, Athenian General, died, aged 46</i> <i>b</i> 404 | <i>Americus Vespasius discovered South America</i> <i>s</i> 1497 |
| <i>Adam dies, aged 930 Years</i> <i>b</i> 3020 | <i>Alexander, Emperor of the East</i> <i>s</i> 911 | <i>Ammon reigns in Ægypt, who</i> |
| <i>Addison, Jos. born 1671, died June 17</i> <i>s</i> 1719 | <i>Alexander the Great, born 356, began to reign 336, conquers the Persians 332, and died at Babylon, March 21</i> <i>b</i> 224 | |
| <i>Adolphus, Gussow, slain in Battle</i> <i>s</i> 1632 | <i>Alexandria in Ægypt built</i> <i>b</i> 335 | |
| <i>Adrian, Emperor, visited Britain, and built a strong Rampart between the Tyne and Frith of Solway</i> <i>s</i> 121 | | |
| <i>Adrianople taken by the Turks</i> <i>s</i> 1359 | | |
| <i>Aeneas, Trojan General, alive</i> <i>b</i> 883 | | |
| <i>Era, Christian, first reckoned by</i> <i>s</i> 532 | | |

who had Fleets of Ships
on the Mediterranean,
and Red Sea b 1034
Amosis, or *Tethmosis*, 2d
K. of all Ægypt b 1070
Amos b 824
Anacreon, Poet b 529
Anne, Queen of England,
born Feb. 6, 1665, mar-
ried to the Prince of
Denmark, 1683, began
to reign March 8, 1702;
crowned April 23d fol-
lowing; died August 1,
aged 49 s 1714
— She was succeeded by
her Cousin, George I.
Electoꝛ of Hanover.
Antigonus routed by Sy-
rians b 316
Antigonus Pius, Emperoꝛ
b 138
Antiochus Epiphanes, be-
gan to reign in Syria
b 175
— Plunders the Temple
of Jerusalem, and mur-
ders 80000 of the Peo-
ple for revolting; put
Blesar & the 7 Brothers
(called Maccabees) to
Death b 173
— He died in the greatest
Torments b 179
Antonius, Emperoꝛ s 161
Appian s 123
Aratus b 277
Archimedes b 218
Argo, the Ship, built by
the Greeks b 589
Argonautic Expedition to
Colchis b 937
Aristotle b 362
Armada of Spain destroy-
ed s 1588
Aroꝛus reigns b 338
Arbaxad reigns over the
Medes b 589
Arrian s 117
Artaxerxes Longimanus
reigns b 464
— He kills his Brother
b 463
Artaxerxes Mnemon reigns
b 405

Artaxerxes Ochus reigns
b 359
Arthur, King of Britain
s 516
Arundelian Marbles com-
posed b 264
Asa, King of Judah,
reigns b 956
Asserbaddon reigns in Af-
lyria, who built Tarsus
and Anciale in 1 Day
b 711
— He invades Babylon
b 681
— He conquers the Jews,
and carries their King,
Manasseh, Prisoner to
Babylon b 673
— He invades and con-
quers Ægypt b 671
— He dies b 668
Astysians beaten by the
Medes, under the Con-
duct of Astyages b 586
Astyages, King of the
Medes b 636
Atchus reigns in Ægypt,
which breaks into sever-
al Kingdoms b 788
Attilian, King of Eng-
land s 924
Atthenians beat the Per-
sians at Marathon b 483
Atreus, governed by Ar-
chons b 1080
— burnt by Mardonius,
Xerxes's General b 478
Augustine, St. s 379
Augustulus, last Emperoꝛ
of Rome s 476
Augustus Caesar, Emperoꝛ,
and sole Master of the
World b 28
Augustus dies (Tiberius
succeeds) s 14
A. Bassianus Caracalla,
Emperoꝛ s 211
Aurora Borealis first ob-
served s 1716
B.

Babel, the Tower of,
building, and Confusion
of Languages b 2131
Bajazet, the Turk, reigns
s 1388

Baronius s 1798
Barons take Henry III.
Prisoner for breaking
Magna Charta s 1258
Battle of Blenheim s 1704
— *Dottingen* s 1743
— *Ramillies* s 1706
— the *Boyne* in Ireland
s 1690
Bede, Venerable s 699
Belgrade taken by the
Turks s 1521
Belshazzar, the last King
of the Babylonians
b 538
Berosus b 316
*Boetius, Erasmus, Coper-
nicus*, Cotermporaries
s 1517
Brutus and *Cassius* being
defeated (having 3 Years
before, murdered Julius
Cæsar in the Senate-
House) kill themselves
b 40
C.

Cabot, John, (a Venetian)
discovered North Ame-
rica s 1498
Cadmus and *Europa* b 1048
Cæsar conquers the Gauls
b 53
— invades Britain b 52
Cæsar, Julius, defeats
Pompey b 49
Cainan, Son of Enos,
born b 3625
Caius Caligula, Emperoꝛ
s 37
Calendar in England cor-
rected s 1712
Cambisa, King of Persia,
took *Nemphes* b 524
— He subdued the *Æthio-
pians* b 523
Carthage and *Corinth*
burnt by the Romans
b 146
Cataline's Conspiracy, *Ci-
cero*, *Varrus* b 61
Cephren reigns in Ægypt
and built another great
Pyramid b 824
Ceres teaches the Greeks
to sow Corn b 1030
Chaldeans

- Chaldeans* began to observe the Stars *b* 2131
Charlemagne, Emperor of Rome *s* 200
Charles I. beheaded *s* 1649
Charles II. King of England, restored *s* 1660
Charles IV. (King of Bohemia) Emperor of Germany *s* 1347
Charles IX. of France *s* 1560
Charles the Great, King of France *s* 767
Charops, first decennial Archon at Athens *b* 647
Chinese Wall built *b* 222
Cleopatra made the Constellations *b* 939
Christ Jesus, our Saviour, born *b* 2
 — crucified *s* 33
Cyrilidon reigns in Assyria *b* 643
Civil Wars in Germany *s* 1404
Claudius, Emperor *s* 41
Cleopatra dies, and *Ægypt* becomes a Roman Province *b* 29
Claudianus Novus, Emperor *s* 96
Columbus, Christopher, (a Genoa) discovers South America *s* 1493
Comes (bright) in the Spring *s* 1744
Commodus, Emperor, *s* 180
Confucius, the Chinese Philosopher *b* 711
Constantina, Emperor *s* 699
Constantine the Great, Emperor *s* 306
Constantinople rebuilt *s* 330
 — Seat of the Roman Empire *s* 550
Copernicus alive *s* 1517
Corcyrians are worsted by the *Corinthians* in the the oldest Sea-Fight *b* 657
Corinthians begin to build Ships with 3 Orders of Oars *b* 697
Cornelius Nepos *b* 29
Cornelius Tacitus *s* 81
Croesus, King of Lydia, conquered by Cyrus, King of Persia; so ended the Kingdom of the Lydians *b* 550
Cromwell, Oliver, dies *s* 1658
Cyrus, 1st King of Persia *b* 560
 — takes Sardes *b* 544
 — takes Babylon *b* 538
 — He overcomes Darius, the Mede, and translates the Empire to the Persians *b* 536
 — He dies *b* 529
Cæsar of Muscovy dies, and his Sons rule jointly *s* 1682
 D.
Damascus and Jerusalem taken by the Saracens *s* 636
Damascus taken by Tiglathpileser, King of Assyria *b* 740
Danes invaded England and were beaten *s* 1002
Daniel *b* 609
Darius, the Mede, reigns *b* 566
Darius, Son of Hytaspes, reigns in Persia *b* 521
Darius Nectans reigns *b* 424
Darius Codomannus reigns in Persia *b* 336
 — He was last King of Persia, and slain *b* 331
David made King *b* 1059
 — He conquers the Edomites, who fly into *Ægypt* *b* 1040
Daedalus invents the Saw, *Wimble*, &c. and introduces these Arts into Europe *b* 989
Democritus *b* 431
Des Cartes *s* 1619
Deucalion's Flood drowned Thessaly *b* 1045
Dido builds Carthage
Pigmalion reigns at Tyre *b* 883
Dioclesian, Emperor *s* 284
Diodorus Siculus *b* 40
Diogenes Laertius *b* 138
Dion Cassius *s* 123
Disynsius *b* 29
Domitian, Emperor, *s* 81
Drake, Sir Francis, sails round the Globe *s* 1580
 E.
Earthquake in Asia, that overturned 12 Cities *s* 17
 — felt from September to November, swallowing up several Cities in Europe *s* 394
 — in Macedonia, so violent, that above 150 Cities were swallowed up by it.
 — throughout the whole Kingdom of England, followed by a great Scarcity of Fruit and late Harvest *s* 1090
 — in Shropshire *s* 1110
 — felt in many Parts of England; France, and Germany, and felt also in Sicily, where 100000 Persons perished by it; also felt in Jamaica, where Port-Royal was swallowed up *s* 1692
 — January 8, February 8, 2 Shocks felt in London *s* 1750
 — November 1, that laid all Lisbon in Ruins *s* 1755
Eclipse of the Sun, predicted by Thales, that put an End to the Battle between the Medes and Lydians, and Peace ensued, May 28 *b* 585
 — of the Sun, August 15, when Agathocles crossed the Sea against the Carthaginians *b* 316
 — total, of the Sun, at London, April 22 *s* 1715
Edmund Ironside, King of England *s* 1040
Edward the Martyr, King of England *s* 975
Edward

- Edward the Confessor*, K. of England : 1042
 — III. King of England, beat the French, and took the French King Prisoner : 1327
 — V. King of England, : 1483
 — VI. King of England, : 1547
Egbert, first sole Monarch of England : 819
Egypt, the King of, orders all the male Children of the Hebrews to be destroyed : 1573
Egyptians began to observe the Stars : 1034
 — They carry their Astronomy to Babylon, and found the *Æra* of Nabonassar : 747
Elizabeth, Queen of England, restores the Reformation : 1558
Enoch, Son of Jared, born : 2328
Enos, Son of Seth, born : 3715
Epiphaneus : 379
Erasmus alive : 1517
Eratosthenes, Epicurus, : 320
Esdra : 464
Esther : 521
Eitelwolf, King of England : 837
Euclid : 326
Eusebius : 306
Exodus : 362
Exra returns to Judea : 457
Exra : 495
 F.
Ferdinand III. Emperor : 1637
Flavius Vespasian, Emperor : 71
 — He sent his Son Titus into Judea, who destroyed Jerusalem; since which Event, the Jews are dispersed all over the Globe.
France, Monarchy of, founded : 440
Frederic, Emperor of Germany, recovers Jerusalem : 1299
Frederic II. Emperor : 1619
Frost, great, in England : 1684
 — another great, in 1739 and : 1740
 G.
Galba, Emperor : 69
Galen, Physician : 135
George I. King of England : 1714
 — II. King of England : 1727
 — III. King of England : 1760
Gideon, Judge of Israel, defeats the Midianites : 1271
Guido Arezzo invents the Notes of Music : 1022
Guns powder Plot : 1605
Gustavus Adolphus, King of Sweden : 1611
 H.
Habbakuk : 729
Haggai : 566
Hannibal, the Carthaginian, defeats the Persians at Pavia : 216
 — He defeats them at Cannò in Italy : 215
Harold usurps the Crown of England : 1066
 — the Dane, King of England : 1096
Henry I. crowned, August 5 : 1100
 — II. King of England : 1154
 — III. King of England : 1216
 — He confirms Magna Charta : 1253
 — IV. King of England, first of the Lancaster Line : 1399
 — V. King of England : 1413
 — He beats the French in the Battle of Agincourt : 1415
Henry VI. King of England : 1422
 — He was deposed, and Edward IV. made King.
 — VII. King of England : 1485
 — VIII. King of England : 1500
Henry, Duke of Saxony, chosen Emperor : 1008
 — VI. Emperor of Germany : 1190
Henry III. King of France : 1574
 — He was stabbed by Clement, a Friar : 1589
 — IV. King of France, stabbed by Ravillac : 1610
Heraclides return into Peloponnesus : 285
Herod, made King of Judea : 40
 — He murders the innocent Children, with Intent to destroy Christ : 2
Herodian : 250
Herodotus, the Historian : 457
Hesiod and *Homer* : 837
Hezekiah reigns in Judea : 740
Hiram, King of Tyre, furnishes David with Timber to build : 1048
Hipparchus, Astronomer : 116
Hippocrates, Physician : 431
Holland revolts from Spain : 1579
Holy League in France : 1756
Honorius, Emperor of Rome : 396
Horace : 29
Hosea : 824
Hunades, J. Emperor of Constantinople : 1442
 I.
Jacob, Son of Isaac, afterwards called *Israel*, born : 1842
Jacob

- Jacob* and his Family, moved by Famine, go into Egypt *b* 1712
James I. King of England *s* 1603
 — II. deposed *s* 1688
Jared, Son of Mahalaed, born *b* 3490
Jehosaphat, King of Judea, reigns *b* 918
Jeremiah *b* 1636
Jerom, St. Rufinus *s* 337
Jerusalem a second Time built by the Command of Darius *b* 520
 — taken by Pompey *b* 62
 — taken by Herod *b* 37
 — and Damascus taken by the Saracens *s* 636
 — regained from the Turks *s* 1009
 — retaken by the Turks *s* 1887
Jewish History ends *b* 412
Jews return from Captivity *b* 536
Inquisition first erected against the Albanians *s* 1222
Job, Son of Issachar *b* 1751
Joel *b* 824
John, K. of Eng. granted Magna Charta *s* 1199
Jonah *b* 860
Joseph, Son of Jacob, born *b* 1751
Josephus *s* 71
Joshua defeats the Gibeonites, and the Sun stands still *b* 1458
 — He dies 110 Years old *b* 1433
Josiah reigns in Judea, *b* 640
 — King of Israel, slain by Nechaoh *b* 609
Jphitus restores the Olympiads *b* 776
Iaac, Son of Abraham, born *b* 1902
Isaiah *b* 824
Israel, Children of, go out of Egypt, and Pharaoh and his Host are drowned in the Red Sea, pursuing them *b* 1496
- Judas Maccabeus* routs Antiochus *b* 166
Judith *b* 590
 — cuts off the Head of Holofernes, Nebuchadnezzar's General *b* 660
Julian, Emperor *s* 337
Julius Caesar alters the Calendar *b* 46
 — burns the famous Library of Alexandria, containing 700000 Volumes *b* 44
 — He was killed in the Senate-House by Brutus and Cassius *b* 43
Justin *s* 138
Justinian, 2d Emperor, but afterwards expelled *s* 686
- L.
- Lamech*, Son of Methusalehm *b* 3876
Leo IV. Emperor, the Pope sets up another *s* 900
 — XIII. King of France *s* 1610
 — XIV. King of France *s* 1643
- London Bridge* built of Stone *s* 1187
London burnt *s* 1666
Lucilius *b* 135
Lucius Florus *s* 217
Lucretius, Livy *b* 29
Lunisolar Year altered to 365 Days *b* 1043
Luther, Martin, began his Reformation of the Christian Religion *s* 1517
- M.
- Maccabeus History* ends *b* 635
Macedon, Kingdom of, founded by Carannas and Perdicas *b* 596
 — becomes a Roman Province *b* 168
Magellan Straits discovered by Francis Magellan *s* 1521
Magi are slain *b* 521
Mabalaktel, Son of Cain, born *b* 3555
- Mabomet's Flight* to Medina *s* 622
Mabomet II. Sultan of the Turks, takes Constantinople *s* 1453
Malacbi *b* 362
Manasseh returns from Captivity *b* 662
Mariner's Compass discovered *s* 1302
Maris reigns in Egypt *b* 860
- Mary*, Queen of England, restores Popery *s* 1553
 — Queen of Scots, beheaded *s* 1588
Mary, Queen, dies *s* 1694
Massacre of the Protestants at Paris *s* 1572
Matbuselem, Son of Enoch, born *b* 3263
 — He dies, aged 969 Years, the oldest Man *b* 2294
Medes revolt from the Assyrians *b* 721
Menes, or *Amenophis*, reigns in Ethiopia *b* 946
Mephres, King of Upper Egypt *b* 1125
Mercator *s* 1572
Missana built *b* 588
Messenian first War *b* 652
Messenian second War *b* 607
Meton *b* 457
Micah *b* 760
Minos reigns in Crete; his Father Asterius (Saturn) flies into Italy *b* 1015
Misphragmutbosis reigns over all Egypt, and drives out the Shepherds *b* 1120
Moors defeated at Tours by the Spaniards *s* 716
Moses born *b* 1377
 — He dies, 120 Years old *b* 1457
- N.
- Nabonadius*, King of Babylon *b* 555
Nabonassar reigns at Babylon *b* 747
Nabonassar

- Nabonassar* defeats Neco *Orus* reigns in Ægypt, and routs the Lybians *Pliny* *P 39*
b 747 *Plutarch* *s 117*
Nabopolassar revolts from the King of Assyria, and reigns over Babylon *Polybius* *b 135*
b 625 *Pompey's* Triumvirate, Rome enslaved *b 58*
Nabum *b 719* *Pompey* slain by Cæsar in Pharsalia *b 46*
Nebuchadnezzar defeats Arphaxad, the Mede *Pope Gregory XIII.* corrects the Calendar *s 1582*
b 661 *Portugal* revolts from Spain *s 1640*
— invades Syria and Judea, under Nabopolassar, his Father *b 606* *Printing* invented *s 1449*
Nebuchadnezzar, King of Babylon *b 604* *Procopius* *s 550*
— He invades and conquers Ægypt *b 566* *Psalmodicus* conquers the other 11 Kings, and becomes King of Ægypt *b 655*
Negropolassar defeated by Cyrus *b 551* — He was conquered by Cambyfes, King of Persia *b 622*
Nebemiah *b 457* — He dies *b 617*
Nero, Emperor of Rome, sets Rome on Fire for Diversion *s 64* *Ptolemy Philadelphus* reigns in Ægypt *b 277*
Newton, Sir Isaac, born *s 1643* *Ptolemy Soter* *b 320*
— died *s 1727* *Pul* founds the Assyrian Empire *b 790*
Nice, Council of, held *s 325* *Pul*, King of Assyria, dies, Tilgappilefar succeeds *b 747*
Ninias, Athenian General, frightened at seeing the Moon eclipsed *b 412* *Punic*, or Carthaginian, first War *b 264*
Niniveb destroyed; End of the Assyrian Empire *b 609* — 2d War *b 217*
— of the Assyrian Empire *b 609* — 3d War *b 349*
Noah, Son of Lamech, born *b 2894* *Q.*
— He builds the Ark *b 2414* *Quintus Fabius Pictor*, the oldest Latin Historian *b 264*
— The Ark finished, the Flood over the Earth, and the World drowned *b 2294* *Quintus Curtius* *s 72*
Noah dies, 950 Years old *b 1944* *R.*
Normans settle in Normandy *s 884* *Rebellion* at Preston *s 1715*
— *O.* — at Culloden *s 1746*
Obadiab, Elias *b 918* *Rehoboam* reigns in Israel, which is divided, and 10 Tribes revolt *b 979*
Ogyges, his Flood. Eligoverns Israel *b 1120* *Ricciolus* *s 1666*
Olympiads, restored by Iphitus, reckoned from this Æra *b 776* *Richard* (Brother to Henry III.) Emperor *s 1256*
Optimus Marinus, Emperor *s 217* *Richard I.* King of England *s 1189*
— II. King of England *s 1377*
— deposed *s 1399*
— III. King of England *s 1483*
River,

- River, New*, brought to London : 1614
Rodolphus II. Emperor, : 1566
Rome built by Romulus (by common Account, 752) : 627
 — Civil Wars at, between Pompey and Cæsar : 82
 — taken by the Goths : 410
Romish Superstition, Opposers of, burnt at Austria : 1315
Russians at Portsmouth, on a dark Friday Evening, March 31 : 1769
 — again, on a dark Friday Evening, January 28 : 1771
 Set on by the Witch Circe, they plot against a Portsmouth Inhabitant; but, Satan being overpowered by Providence, one of the Principals in the Plot (the bloody Butcher) set off for London, encouraged by the Rest, (since the late Dock-Fire), to prevent Discoveries, and receive his Reward.
Rufinus : 337
Ruth : 1271
 S.
Sabas Duchinus, King of Assyria, reigns : 668
 — He dies : 647
Salladine, Sultan of the Turks : 1170
Salust : 46
Salmanassar succeeds Tiglathpileser : 729
 — He takes Samaria, and carries the 10 Tribes captive to Nineveh : 721
Sampson destroys himself with 300 Philistines : 1116
Samuel judges Israel : 1094
 — He dies : 1060
Saghebation : 760
Saul, King of Israel : 1070
 — being defeated by the Philistines, kills himself : 1060
Scaliger : 1580
Semiramis flourishes : 760
Sennacherib slain. The Medes revolt from the Assyrians : 717
Seneca : 37
Septimus Severus, Emperor : 193
Sesac, Son of Ammon, invades Arabia Felix, and sets up Pillars by the Red Sea : 1010
 — He reigns in Ægypt : 1002
 — He invades India, and sets up Pillars on the Ganges : 971
 — He conquers Thrace, kills King Lucergus, has Æthiopians in his Army commanded by Pan, and Lybian Women commanded by Minerva : 968
 — was slain by his Brother Isopetus, or Neptune : 956
Setb, Son of Adam : 320
Seutonius Tranquillus Proletary : 96
Socrates : 405
Sodom and *Gomorrha* burnt : 1903
Solon : 609
 — Archon of the Athenians, makes Laws for them : 562
Solomon reigns, and marries the Daughter of Ammon, King of Ægypt : 1019
 — his Temple founded : 1015
 — finished : 1009
 — He dies : 979
Solomon, Emperor of the Turks : 1520
Spanish Armada destroyed by the English : 1588
Spanish Fleet destroyed near Sicily : 1718
Sparta built : 1060
Syracuse built by Archias : 719
 — taken by Marcellus : 213
Syphus reigns in Corinth : 983
 T.
Tamerlane, the Tartar, reigns : 1388
 — He defeats Bajazet, conquers Babylon, Persia, China, and India, (The Great Mogul descended from him) : 1399
Tarantum built by Phalantus : 620
Tarquin, the last King of the Romans expelled, and Consuls elected : 508
Terrene : 166
Thales Milesius : 596
Theodoret : 425
Theodosius, Emperor : 379
Theodosius III. Emperor : 714
Theseus reigns at Athens, and overcomes the Minotaur : 968
Theseus, King of Athens, stole Helena : 938
Thucydides : 508
Tiberius II. Emperor : 575
Tiglathpilesar succeeds Pul, and reigns at Nineveh : 747
Tirkahab reigns in Ægypt : 687
Titus Vespasian, Emperor : 79
Trans, Council of, : 1540
Triumvirate of Mark Anthony, Lepidus, and Augustus : 40
Trojan, Pompeius, lived just after Christ's Birth.
Troy besieged by the Grecians : 914
 — taken : 904
Turks conquer Persia, and take Jerusalem : 1070
Turks

<i>Turks at War with the Emperor</i>	<i>: 1682</i>	<i>Cornelius Nepos, Co-temporaries</i>	<i>b 29</i>	<i>Xerxes reigns (called also Abasuerus)</i>	<i>b 485</i>
<i>Tycho Brabe</i>	<i>: 1580</i>	<i>Vitellius, Emperor</i>	<i>: 70</i>	<i>— defeated by the Greeks</i>	
<i>Tyre built by Aradus</i>	<i>b 1048</i>	<i>Union of Scotland with England</i>	<i>: 1707</i>	<i>— passes over the Hellespont, fights Leonidas, King of Sparta, who beats him</i>	
V.		W.		Z.	
<i>Valentinian and Valens, Emperors</i>	<i>: 364</i>	<i>War, holy, against the Turks</i>	<i>: 1096</i>	<i>Zecbariah</i>	<i>b 566</i>
<i>Valentinian III. Emp.</i>	<i>: 425</i>	<i>William the Conqueror, King of England</i>	<i>: 1066</i>	<i>Zedekiah reigns in Judea</i>	
<i>Venetians defeat the Turks at Sea</i>	<i>: 1572</i>	<i>William and Mary, King and Queen of England</i>	<i>: 1689</i>	<i>Zephaniah</i>	<i>b 636</i>
<i>Venice built</i>	<i>: 41</i>	X.		<i>Zoroaster</i>	<i>b 521</i>
<i>Victa</i>	<i>: 1603</i>	<i>Xenophon</i>	<i>b 405</i>	<i>Zosimus</i>	<i>: 379</i>
<i>Virgil, Horace, Ovid, Luccretius, Livy, Dionysius,</i>					

N. B. In future Palladiums, to suit the first Part of our Work, we propose to give ALPHABETICAL CHRONICLES of the more modern and extraordinary EVENTS: Such as, remarkable Battles, Sea-Fights, Accidents by Thunder and Lightning; of Earthquakes happening, and Volcanos emitting Flames and vomiting liquid Fire; of Winds, Storms, Tempests, and Hurricanes; of Heats and Dryness, Rains, Floods, and Inundations; Great Frosts, Plenty, Scarcity, and Famines; Sickness, Plague, and Pestilence; miraculous Phenomena, and strange Occurrences; of Destructions and Ejections; Births and Deaths of eminent Persons; and of God's Providence presiding over Men and Things. With separate and successive CHRONICLES of the first King of each Country, as far as they are known; and the present Kings thereof. Also, a successive CHRONICLE of all the Roman Emperors, from the Foundation of Rome. A successive CHRONICLE of all the Kings of England since the Heptarchy. Another CHRONICLE of all the Kings of Scotland. When each Emperor and King began his Reign, and the Years he reigned. And other curious and useful Chronological Accounts.

PART II.

ANSWERS to all the ÆNIGMAS in last Year's PALLADIUM.

- | | |
|----------------------------------|-------------------------|
| I. FURS, or HEATH, on the Moors. | V. A CONSTABLE'S STAFF. |
| II. A FLOWER-POT. | VI. A WEATHER-HOUSE. |
| III. The SUN. | VII. A WINDOW. |
| IV. A Note of INTERROGATION. | Prune, LEAVEN. |

ANSWERS to all the ÆNIGMAS, by the Rev. Thomas Vaughan, A. M. of Morpeth, Northumberland.

To SOPHIA.

DEAR SOPHY, your Request can I deny?

To solve th' Ænigmas therefore I will try.

The first is *Heath*, of ev'ry Moor the Pride.

A *Pot with Flowers*, next, sparkling like a Bride,

The third does represent the radiant *Sun*,

The fourth is *Pore's Interrogation*.

The

ANNUAL MISCELLANY, 1772.

The fifth a *Staff*, for many Uses fit.
 The sixth a *Weather-House*, that foretels it.
 The seventh a *Threshold*, or a *Window-Light*.
 Leaven the Prize. — Dear SOPHY, am I right?

ÆNIGMA V. answered by Mr. John Shadgell [or Shadgett] of Kels, Herefordshire.

OF all the Contrivances us'd in the Nation,
 To suppress Rage and Tumults, and Vices in Fashion,
 Though the Means and the Methods are legal and many,
 The *Constable's-Staff* is as useful as any.

Mr. Richard Dalton, of Pool, (who writes an elegant Hand), answered the 3d and 4th *Ænigmas*. Mr. John Skermer, of *Abby de la Zouch*, answered 1, 3, and Prize. Mr. Thomas Adcock, of the same Place, answered all the *Ænigmas* in Verse. Mr. Thomas Stuchfield, of *Ratcliff*, 1, 6. Mr. G. Lacey, of *Bridport*, answered several in Verse. Mr. Swift answered most of the *Ænigmas* and *Rebuses*, and all the *Paradoxes*, in Verse, and proposed some Things we have not Room for. Mr. J. Scott, of *Cawthorne*, answered the 1st, 3d, 5th, and 6th *Ænigmas*. Mr. James Muscroft, of *Rotherham*, solved the 3d, 5th, and 6th *Ænigmas*. Mr. Michael Taylor, of *Marley-Hill*, near *Newcastle*, answered them all. Mr. W. Wells, of *Crowle, Lincolnshire*, answered the 1st, 4th, 5th, 6th, 7th, and Prize. Mr. J. Bailey the *Prize*, 1st, 3d, 5th, 6th, and 7th.

All the *ÆNIGMAS* answered by Mr. Stephen Hartley, of Sowerby-Bridge.

On the Principal belonging to a Set of unnatural Authors.

WHAT Witch could move thy Wrath to write,
 Or Muse, in Mask, to shew her Spite? *Interrog. 4.*
 Thy Libel, if perform'd at School,
 Shews that thou dost not write by Rule. †
 Hadst thou no Reason — Nought to fear,
 When thou with Russians didst appear?
 The Hemp was sure, had Balls mis-spel,
 Or had not Steel turn'd white Frocks red.
 Thy Deeds deserve an Iron Wreath,
 Thyself uprais'd where grows the Heath: 1.
 Like those who out of Day-light run,
 To do those Things that shame the Sun. 3.
 First, may thy Throne exalted be
 To see below whom thou canst see!
 Thy Hands and Feet extended wide,
 With wooden Neckcloth round apply'd;
 Where, peeping, thou mayst shew thy Face 7.
 Of Wainscot Hue, and Front of Brass:
 Where *Staffs* the waiting Crowd command, 5.
 Some posting thee on either Hand;
 To make thee from thy Ways decline,
 To fight for *Shes*, not *Hes* to whine.
 Like Miss Stow's *Man*, love Beauty's *Flow'r* 6. 2.
 And own its Force and magic Pow'r.
 Reform — or still want Health and Bread, *Prize*
 And Things that Honest Folks do need.
 And when thy Vice is Hate to thee,
 I wish thee Health, Wealth, Liberty.

† Thou cries, [20] *forgets*, [18] *thou sleeps*, [23] *thou bows*, [52] *thou doth*, [25] *Thou knows*, [211] *But have*, [153] *what all affords*, [70] *forsooth*.

Answer

THE BRITISH PALLADIUM, OR,

Answer to the PRIZE-ÆNIGMA, by Mr. G. Lacey, of Bridport.

IF Sophy's be the wish'd-for *Leav'n*,

To me then let the *Prize* be giv'n.

By Mr. Coughron, of Newcastle upon Tyne.

IF Sophy's *Leav'n* be the right,

The *Prize-Ænigma's* brought to Light.

All the ÆNIGMAS and REBUSES answered by Gemini, of Morpeth.

On a Set of Libellers and unnatural Authors.

1. IF Impudence can pass for Sense,
And Spleen and Spite for *Wit* and Satyr, 3. *Reb.*
The Rational have fair Pretence
To write against the Outs of Nature.
2. When Haters of the female Sex
The Passions natural disdain,
The Fair, more just, an Odium fix
On S-d-m's Sons and Seed of Cain.
3. Enamour'd of the Masculine,
The Foes declar'd to female Charms,
For Men and Youth, not Beauty, pinc,
And Innocence corrupt with Harms.
4. Assembled how these Lovers greet,
Their Arms around each other's Waist !
Their Looks so languishingly sweet,
As if the Joy they long'd to taste !
5. A Beauty, with his Br——s large,
Makes all their Mouths to run with Water !
They all upon his Praise enlarge,
As, above all, worth running after.
6. Sighers for Men, Men Oglers turn, † † See *Churchill's Times.*
Who marry but to hide their Crimes ;
Their Fondness shun, Love-Letters burn,
Though you'll be libel'd for't in Rhimes. † † Several printed
Libels have been
dispersed against the
Palladium - Author
for publishing Ac-
quaintance with
these infamous Le-
vers.
7. Confed'rate Friends their Libels spread ;
Each swears for other black is white :
They threaten Law, when most they dread,
And Russians hire, to plot by Night.
8. Our Author justly may despise
These Infamites of Guilt and Shame :
Their Libels bear the Date of Lies ;
His Works preserve a lasting Name.
9. T'interrogate — A Word with you : 4. *Æn.*
Are ye in Shame but new Beginners ?
Don't you Untruth and Malice shew,
And prove yourselves case-hardened Sinners ?
10. Your Libels, burnt, are but in vain ;
Palladiums, for their Use, will last ;
Your Work is all to do again ;
The next will be as is the last.
11. Male Lovers shame ev'n Prostitutes ;
But Honours wait the nat'ral born ;*
You rank below the nat'ral Brutes,
And, among scorn'd, are most the Scorn.
12. Your Morias, Marias, Mollics, Dames,
The Goddesses to whom you're wed,

* *William the Con-
queror, King of Eng-
land, was natural Son
of a Skinner's Daugh-
ter.*

Yous

Your Partners of illustrious Names,

Are finely fraught and brought to Bed.] *With Cuckoo-Birds,*

23. Though some are barren as their Lords,
They ne'er are backward for their Dulness;
While Sophy wins her Dear by Words,
Some like her for her Limbs and Full-dress.
24. Sophy's superior Parts can please,
Who far exceeds the Rest in Riches;
She gain'd her dear Dupee a Place, * *Mr. George Horner Dupee*
By changing less for bigger Breeches.
25. Her Table and her Charms she spreads,
And bribes with Dinners and with Smiles;
And Troops of Lovers captive leads,
While she poor Yea-and-Nay beguiles.
26. The high Road to Preferment is
By Pathics wed to passive Wives;
What one escapes the other has,
Who make the most of both their Lives.
27. Twin-born am I, and boldly stand,
With Staff erect, to guard the Fair; 5. *Æn.*
While Pleasure I for them command,
How curst the Wretch who would debar!
28. Your *Leaven* Christians all refuse, *Prize.* † *A Jew at Passa-*
Of Levi's Tribe † — who lent you Aid; *mouth, who sells old*
For Sophy's Sake, her Sex excuse, *Cloaths, and distri-*
Her Dupee is of your own Trade. † *buted Libels for one*
29. Your Deeds the Sun has seen by Day, 3. *Æn.* of the Confederates,
Your Works are known in darkest Weather; 6. *who, to make him*
Your Letters ¶ writ your Shame betray, *Amends, Borrow'd of*
Thro' Windows looking all together. 7. *Æ.* him an old red Waist-
20. Furs on the Heath can Witness bear 1. *Æ.* coat, after the Lace
How Thieves from Cities roam for Prey; *was cut off.*
- And Anti-Infamites declare, † *A Finder of the Longitude.*
Where Infamites ¶ by Night way-lay. ¶ *Threatening Letters.*
21. To ask Miss Hay I'm not afraid, 2. *Reb.* ¶ *Dock-Yard Fire;*
If Billington or Pool she chuses, 7. 4. *Reb.* *Assassins, &c.*
Where Abbot's Bride is to be made, 5. 1. *Reb.*
If one at *Lewes* he refuses, 6. *Reb.*
22. I will protect the fairest Flow'r,
A tender Flow'r, not yet full-blown;
I'll guard it carefully each Hour,
Until within a Pot 'tis shewn. 2. *Æn.*

Mr. G. Coughron, of Newcastle, (late of *Wrisgill, Northumberland*), answered all the *Enigmas*.

ANSWERS to the QUERES in last Year's PALLADIUM.

I. QUERE 214, answered by Mr. George Newland, at Mr. Nichols's School, in the Isle of Wight.

HAROLD I. the second Danish King of England, was first buried at *Westminster*; but his Body was soon after taken up, by Order of King *Hardicanute*, and flung into the River *Thames*; whence it was taken up by a *Fisherman*, and conveyed to a Church-Yard in *London* belonging to the *Danes*, (probably now *St. Clement's Danes in the Strand*), where it was again interred with Honour. *Divi Britannici*, P. 179, 180. *Milton*, P. 311, 322. H.

II. QUERE 215, answered by Mr. George Newland.

THE Names of the *Week Days*, which we now use, were derived from our Ancestors, the Saxons; who, among other *Deities*, worshipped the *Sun, Moon, Tuisko, Woden, Thor, Friga, and Seatur*; from whence came *Sun's Day, Sunday; Moon's Day* (by Corruption) *Monday; Tuisko's Day* (by Corruption) *Tuesday; Woden's Day, Wednesday; Thor's Day, Thursday; Friga's Day, Friday; Seatur's Day, Saturday*; also by Corruption. See *Virtigan's Nationum Origo*, P. 24 to 86.

Or, the Answer to the Latin QUERE, in Latin, thus.

Dies Solis Nomen habuit, quia hoc Die Saxones Soli sacrificabant.

Dies Lunæ, quia hoc Die Lunæ sacrificabant.

Dies Martis, quia Tuiskoni hoc Die sacrificabant.

Dies Mercurii, quia Wodeni hoc Die sacrificabant.

Dies Jovis, quia Thorti hoc Die sacrificabant.

Dies Veneris, quia hoc Die Frigæ sacrificabant.

Dies Saturni, quia hoc Die Seatro sacrificabant.

III. QUERE 216, answered by Mr. G. Newland.

LET the upper Pulley be fixed to a Beam, and a Rope pass from every Pulley to the Weight to be raised; by which Means 1 lb. by 4 Pullies, will raise a Weight of 15 Pounds.

This Quere, Mr. Hardy, of Cottingham, says, was taken from *Fletcher's Mensuration*; as, he says, are some of the Questions proposed.

IV. QUERE 217, answered by Mr. G. Newland.

THE least Triangle, circumscribing a Circle, is *equilateral*; consequently, the least Cone, circumscribing a Sphere, is *equilateral* also. Its required Dimensions are as follow; viz. the Base and each Side = 3.897 Feet; whence the perpendicular Height = 3.3749 Feet. W. W. R.

Or, in Latin,

Latus minimi Coni (qui equilateralis est) circumscribentis datam Sphæram (Pedum $2\frac{1}{2}$ Diametrum habentem) Pedes 3.897 continet; et Perpendicularis Altitudo, 3.3749 Pedes habet.

Mr. Stephen Hartley says, he has seen the above Quere in a *Ladies Diary*.

Mr. Robinson, of Biddick, determined the Side of the least Cone, circumscribing a Sphere, = 3.898.

We are obliged to Mr. Kilwin (a young Gentleman of 18) for his Productions; but our Plan is not to insert Questions concerning *Series*, or *fluxional Equations*, (the Handling of which is seen among the Writers on the Subject), without a direct Application thereof is made, practically, in the Question.—We esteem his Abilities and Favours, and hope to oblige him more hereafter in what is *practical*, or applied to Use.

Mr. Alexander Rowe writes thus.

Premièrement, $2\frac{1}{2} \times 2 = 4\frac{1}{2}$ = le Hauteur, et $2\frac{1}{2} \sqrt{2} = 3.1819$, &c. Pés, sont le Diamètre du moindre Cone. Q. E. F.

Mr. Wilham Hardy, of Cottingham, finds the Cone's Altitudo and Diameter at the Base as above.

V. QUERE 218, answered by Conjecture.

THE Oysters, and other Substances, dug up at Catgrove, near Reading, in Berkshire, are, in my Opinion, the Consequence of some subterraneous Eruption, (as are the Variety of Strata in other Parts) whereby the Sea has shifted its Place and Boundary, and left the Diversity of Sea Strata, Oysters, and other marine Substances, as they are found and appear from the said shifting Cause. Which

which Cause is the Change of Situation of the Sea; overflowing *vast Tracts* of dry Ground, and leaving others, that were covered with Sea, to unbosom its Variety of Fossils, or Textures of an earthy Substance; or else to be covered with *Verdure*, as the Seeds of Vegetables, scattered up and down the Substance of the whole Earth, and the impregnating Air, took Effect.

VI. QUERE 219, answered by Mr. George Hicks, of Reedness.

THE Word *Residue* retains the same Sense as the Word *Rest*, or *Remainder*; therefore it certainly is a *Substantive*; and no *Adjective*, like *residual*.

VII. QUERE 220, answered by an English Grammarian.

ACCORDING to Custom, in the *English* Mode of Speech, which is the *greatest Authority*, Bishop *Lowth* is got into a *Dilemma* here, betwixt the *English* and *Latin* Customs of Speech, where the *English* Custom, by the Rule of Transposition, ought to predominate: *Do you think me to be who?* or, *Who do you think I am? Somebody or Nobody?*

PRIZE-QUERE answered by the Palladium-Author.

SINCE the Years, &c. 3, 2, 1, before, and 1, 2, 3, &c. since *Cbrist*, immediately precede and succeed one another, there is no 0 Year of *Cbrist*, which is a *Non-entity*; and since, of the 1, 2, 3, 4 Years since *Cbrist*, the 4th Year since is *Bissextile*; therefore the 1st Year before *Cbrist* will be *Bissextile*; also 101, 201, 301, &c. *Bissextile*, and not 0, 100, 200, 300, &c. before *Cbrist*, as Mr. Mayer, and Mr. *Moskelyne*, after his Error, have published. Hence, from the Beginning of the 0 Year, which improperly represents the 1st Year before *Cbrist*, to the Beginning of the 1st Year since *Cbrist*, will be exactly 1 whole *Bissextile* Year of 366 Days. Also, from the Beginning of the 1st Year before, (denoted by the 0 Year,) to the Beginning of the 100th Year since, *Cbrist*, is exactly 100 *Julian* Years. And therefore the Year (as before observed) that next preceded the 1st Year of, or since, *Christ*, was the 1st Year before *Christ*, or the last *Bissextile* Year next preceding his Birth.

If Mr. *Moskelyne*, who has printed Mr. Mayer's Tables, erroneous in their Chronology by 1 Year, and sits with Authority, as Commissioner at the Board of Longitude, to determine on Matters of Importance, can decide this Matter otherwise, it is hoped that the Truth will induce him so to do; and to tell us what the 0, 100, 200, &c. Years before *Christ* (*Bissextile*, or otherwise) signify; as they all appear to be printed for Years *Bissextile*.—If the 0 Year is a Year of *Non-entity*, and yet denotes *Bissextile* and also the Year of *Cbrist*'s Coming, and the 1st, 2d, 3d, and 4th Year before and since that 0 Year *Bissextile*, or before and since a *Non-entity*, the Paradox in Mayer's Tables and Chronology, (that cost the Nation 3000l.) of 100, 200, 300, &c. before *Cbrist*, being all *Bissextile* Years, may be made out; but not otherwise. The 0 Year cannot express the Beginning of any Year.

Mr. *Judson*, of *Beverley*, answered the same by Tab. p. 347, *Royal Astronomer*, from the *Julian Period*.

But the Rev. Mr. O. Piper, non *A. R. Greenowicensis*, is considerably out of his Calculation, in his Answer to this Quere, both in Longitude and Latitude. He makes the 0 Year before *Cbrist* (as expressed by Mr. Mayer in his Tables) to be the 1st Year of *Cbrist*, or of *Cbrist*'s Nativity, though a Year of *Non-entity*, and though the 1st Year before, and 1st Year since, *Cbrist* next precede and follow one another: And so from the Beginning of the Year of *Cbrist*'s Nativity, to the Beginning of the 1st Year since (or of) *Cbrist*, he makes, according to Mayer's Tables, he says, exactly 366 Days, [though, in Fact, the Year preceding the Year of *Cbrist*'s Nativity was *Bissextile* 1.] And from the Beginning of the 0 or no Year of *Cbrist*, to the Beginning of 100 Years since *Cbrist*, he makes 100 *Julian* Years; and confidently says, that every one of which

31 THE BRITISH PALLADIUM, OR
*which Things are right, as they stand in Meyer's Tables; though evidently
 erroneous by 1 Year.*

ANSWERS to the REBUSES in last Year's PALLADIUM.

- | | |
|----------------|------------------|
| I. A BRIDE. | V. ASHTON. |
| II. HAY. | VI. LEWES-Town. |
| III. WIT. | VII. BILLINGTON. |
| IV. POOL-Town. | |

REBUS I. answered by Mr. Thomas Struckfield, of Stepaey,
 THE Fair, who wishes not to be a *Bride*,
 Nor Nature has, nor Reason, for her Guide.

REBUS VII. by the same.
 TO please Miss *Billington* is very hard,
 Who twenty Lovers did last Year discard.

All the REBUSES answered by the Rev. Thomas Vaughan, A. M. of Morpeth,
 Northumberland.

Pool, Lewes, Hay, three Rebuses explain, 4. 6. 2.
 And *Ashton's witty Bride* three more contain: 5. 3. 1.
 The last of all is *Billington*, we find, 7.
 And all the Answers as they were design'd.

The 1st, 4th, and 6th Rebuses were answered by Mr. John Shadell, of
 Rofs, Herefordshire.

All the REBUSES answered by Mr. George Newland, at Mr. Nicholson's
 School, Teacher of the Mathematics and Land-Surveyor, at Newport, in the
 Isle of Wight.

MISS *Hay's* fair Form *Wit*, Sense, and Beauty grace: 2. 3.
 Her Sex's Ornament, that ours can please.
 At *Pool* and *Lewes* some fair Females dwell, 4. 6.
 But *Billington* the *Bride* can none excel. 7. 1.
 May *Ashton* next a tender Mother be 5.
 Of a fine, lovely, num'rous Progeny.

Mr. John Skermer, of *Asby de la Zouch*, answered the 4th, 6th, and 7th
 Rebuses. Mr. T. Adcock 1, 4, 6, 7, in Verse. Mr. T. Struckfield, of *Ratcliff*,
 4. 6. 7. Mr. G. Lacey, of *Bridport*, 1, 3, 4, 5, 6, 7, in Verse. Mr. R.
 Dalton, of *Pool*, 1, 4, 6, 7. Mr. James Muscroft, of *Ratcliff*, 4, 6, 7.
 Mr. Stephen Hartley, of *Sowerby-Bridge*, 1, 3, 4, 6, 7. Mr. W. Turner, of
Witney, *Oxfordshire*, 1, 4, 6. Mr. Alexander Rowe, 1, 3, 4, 6, 7. Mr.
 Mich. Taylor, of *Marley-Hill*, near *Newcastle*, 1, 2, 3, 4, 6, 7. Mr. W.
 Wells, of *Crowle*, *Lincolnshire*, 1, 2, 3, 4, 6, 7. Mr. J. Bailley, of *Mid-*
dleton, *Yorkshire*, 1, 3, 4, 6, 7. Mr. G. Coughron, of *Newcastle*, answered
 all the Rebuses.

ANSWERS to the PARADOXES in last Year's PALLADIUM.

I. PARADOX answered by Mr. G. Lacey, of *Bridport*.
 A Dyer, 'tis clear to me, might die,
 Before his Son was born, or I.

Mr.

Mr. W. Wells, of Crowle, Lincolnshire, answered it much in the same Manner.

Mr. John Skermer, of Asby de la Zouch, answered it; as did Mr. James Muscroft, of Rotterham; Mr. W. Turner, of Witney, Oxfordshire; Mr. Mich. Taylor, of Marley-Hill, near Newcastle; Mr. Richard Dalton, of Pool; Mr. Alexander Rowe; Mr. John Bailley, of Middleton, Yorkshire, acrostically.

I. PARADOX answered (in the Taste of the Proposer) by Mr. G. Newland, at Mr. Nicholson's School, at Newport, in the Isle of Wight.

To Mr. Oliver, the Proposer.

YOUR Father, Sir, once liv'd by dying;
And now, perhaps, he dies by living.

II. PARADOX answered by Mr. George Newland.

LET the Concavity of one Bag (of equal Weight with the other) be a cubic Foot; and the Concavity of the other Bag $\frac{1}{2}$ cubic Foot. By Mr. Emerson's Weights and Measures, p. 18, a cubic Foot of Air weighs 1.25 Ounces, which multiplied by $\frac{1}{2} = .75$, the Difference of Size between the two Bags, gives .93750 $\frac{1}{2}$. Hence the Pound of Feathers in the larger Bag weighs 1 Pound; and the Pound in the lesser Bag weighs 1lb 0.9375 Oz.

Corollary. Hence an Advantage accrues to the Seiler of Wool, and of other compressible Bodies, when they are closely pressed; and, consequently, a Disadvantage to the Buyer: For the closer compressible Bodies are pressed, the more they will weigh.

Mr. Stephen Hartley also observes, that the Feathers, in one Bag, hard pressed together, and in the other loose and mixed with Air, solves it, when both Bags weigh equal.

Mr. Richard Dalton accounted for it by a false Balance, with one Arm of the Beam longer than the other; a common fraudulent Practice, in many Parts of this Kingdom, to the Scandal of Magistrates who suffer it. Mr. Michael Taylor says Feathers, Wool, &c. will weigh more when pressed hard together than otherwise. Mr. Alexander Rowe answers it to the same Purpose.

Mr. William Wells to the Dealers in Feathers, Wool, &c.

YE Dealers in Feathers and Wool, by the Freight,
The less Room you pack in, the more is the Weight.

Mr. G. Coughron, of Newcastle, answered both Paradoxes: Who judiciously observes, that Feathers and all light compressible Substances weigh the most when they are most compressed, or put into the least Compass they will admit of. Hence the Difference of Weight, of the same like-weighting Substance, separately weighed, and weighed when put in Cases of equal Weight, but of different Magnitudes, is universally accounted for.

ANSWERS to the QUESTIONS in last Year's PALLADIUM.

Arithmetic, that curious, useful, Art,
Delights the Mind, and Wonders does impart;
By its extensive and sugacious Aid
A Nation flourishes in Wealth and Trade.

I. QUESTION 423, answered by Mr. George Newland, at Mr. Nicholson's School, in the Isle of Wight.

PUT x = the Number of Eggs; then 120 Eggs, at 2 for a Penny, come to 60d; and $\frac{x}{2}$ is the Price of the Eggs at 3 for a Penny. Whence, 120 + $\frac{x}{2}$ at

at 5 for 2d. $= 48 + \frac{2x}{5}$. And by *Loss and Gain*, $60 + \frac{x}{3} : 48 + \frac{2x}{5} ::$

100 : 119 ; whence, by multiplying Extremes and Means, $14400 + 120x = 21420 + 119x$; and, by Reduction, $x = 7020$ Eggs, required.

The same was elegantly and correctly answered in this Method, or a little differently, by *Gemini*, of *Morpeth* ; Mr. *Robinson*, of *Biddick* ; Mr. *Dalton*, of *Pool* ; Mr. *John Lynn*, *Pitman*, of *Ruffe*, *Northumberland* ; Mr. *Thomas Adcock*, of *Asby de la Zouch* ; Mr. *J. Scot*, of *Cawthorne* ; Mr. *John Lowe*, Schoolmaster, at *Birmingham* ; Mr. *Charles Taylor*, Pupil to Mr. *N. Brownell*, of *Coventry* ; Mr. *George Hicks*, of *Reedness* ; Mr. *James Muscroft*, of *Rotherham* ; Mr. *Pen*, the Proposer, of *Cheffont* ; Mr. *John Young*, of *Ruffe*, *Northumberland* ; Mr. *James Wood*, of *Newcastle* ; Mr. *Thomas Goodlad*, of *Cottingham*, near *Hull* ; Mr. *George Grant*, Pupil to Mr. *Judson*, of *Beverley* ; Mr. *Benjamin Tourton*, of *Keldasson*, near *Derby* ; Mr. *Alexander Rowe*, of *Cornwall* ; and Mr. *Michael Taylor*, *Newcastle upon Tyne*. — Mr. *John Fryer*, Master of *Trinity-School*, *Newcastle*, and Mr. *W. Wells*, of *Crowle*, accurately answered it. Mr. *W. Pearson*, of *Northfields* ; Mr. *John Curr*, of *Bushblades*, near *Newcastle* ; and Mr. *John Milne*, of *Horoden-Pans*, *Northumberland*, answered it ; as did Mr. *Coughron*, of *Newcastle*, in a curious Manner.

II. QUESTION 424, answered by Mr. Robinson, of Biddick.

AS 100 : 104.5 :: 1 : 1.045, the Amount of 1l. for a Year ; and as 100 : 5 :: 650 : 32.5l. one Year's Interest. Let $x =$ the Years required.

Therefore $650 + 32.5x =$ Amount of Simple-Interest ; $580 \times \overline{1.045}^x =$

the Amount of the Compound-Interest. Therefore, $580 \times \overline{1.045}^x =$

$650 + 32.5x = 600$, per Quest. Whence, $\overline{1.045}^x = \frac{1250 + 32.5x}{580}$;

solved, $x = 30.8$ Years, required.

Mr. *G. Newland*, of *Newport*, puts $t =$ Time required ; $a = 600$ l. Difference of Amounts ; $s = 580$ l. P. 650l. $R = 1.1045$, Amount of 1l. for a Year ; $r = .05$, Rate at Simple-Interest. Then, by a known Theorem, we

have $sR^t - prt + p = a$. From whence, by Logarithms and the Method of Trial and Error, $t = 30.8062015$, &c. Years, confirming the Truth of Mr. *Robinson's* Solution, to greater Accuracy.

Mr. *Pen*, of *Cheffont*, answered it ; as did Mr. *John Lowe*, of *Birmingham* ; Mr. *J. Scot*, of *Cawthorne* ; *Gemini*, of *Morpeth* ; and Mr. *Dalton*, of *Pool*. Mr. *Young*, of *Ruffe*, gave a Theorem, but no Numbers. Mr. *Stephen Hartley* gives 30.816 Years ; Mr. *James Wood*, of *Newcastle*, 30.809. Mr. *T. Goodlad*, of *Cottingham*, and Mr. *G. Grant*, Pupil to Mr. *Judson*, of *Beverly*, solved it. Mr. *G. Hicks*, of *Reedness* Free-School, elegantly : As did likewise Mr. *Alexander Rowe*, by Trial and Error. Mr. *Michael Taylor*, of *Marley-Hill*, near *Gibside*, near *Newcastle-upon-Tyne*, elegantly solved it. Mr. *John Fryer*, Master of *Trinity-School*, *Newcastle* ; Mr. *W. Wells*, of *Crowle*, *Lincolnshire* ; Mr. *John Cur*, of *Buckblades*, near *Newcastle* ; and Mr. *W. Hardy*, Master of *Cottingham School*, answered it. Mr. *Coughron* puts $650 = a$; $.05 = b$; $580 = p$; $1.045 = r$; $600 = c$; and the required Time $= t$.

Then, by the Question and known Theorems, $pr^t - a + abt = c$; whence, by Trial and Error, $t = 30.81$ Years, very nearly.

III. QUESTION

III. QUESTION 425, answered by the Palladium-Author.

IT is evident that all the *Posts* and *Rails* should bear some certain *Ratio* to each other, in Order to determine the Loads in any Number of *Posts* and *Rails*, by the Load, or Loads, in any other Number of *Posts* and *Rails* given. Let every *Post* be to every *Rail* in Weight as 1 to x ; then 1 P. : x R. :: 40 P. : 40 x R. And 1 P. : x R. :: 700 P. : 700 x R. Now 40 x R. + 100 R. :

$$1 \text{ L.} :: 700x \text{ R.} + 2900 \text{ R.} : \frac{700x + 2900}{40x + 100} = \text{Loads required.}$$

When $x = 1$, (or 1 *Post* = 1 *Rail*,) then $\frac{700 + 2900}{40 + 100} = 25\frac{5}{7}$ Loads.

When $x = 2$, (1 *Post* = 2 *Rails*,) then $\frac{1400 + 2900}{80 + 100} = 23\frac{8}{9}$ Loads.

When $x = 3$, (1 *Post* = 3 *Rails*,) then $\frac{2100 + 2900}{120 + 100} = 22\frac{8}{11}$ Loads.

Had it been proposed, *If 40 Posts and 100 Rails be 1 Load, how many Loads will 700 Posts and 1750 Rails (instead of 2900) make?* it would have admitted an Answer; because the first *Posts* and *Rails* are in the same Proportion to one another as the second *Posts* and *Rails* given.

As 40 *Posts* to 100 *Rails*, so 700 *Posts* to 1750 *Rails*.

Now if 40 P. + 100 R. : 1 L. :: 700 P. + 1750 : $\frac{700 + 1750}{40 + 100} = 17\frac{1}{2}$

Loads; and, universally, if a *Post* to a *Rail* be as 1 to x ; then $\frac{700x + 1750}{40x + 100}$

= $17\frac{1}{2}$ Loads, let x be what it will, or the Ratio of 1 *Post* to 1 *Rail* ever so various. Most of the Correspondents miscomprehended and wrong answered this Question, as widely as the Proposer misproposed it.

Mr. John Lynn, a Pitman, of Ruffe, Northumberland, judiciously puts m to 1, for the Ratio of a *Post* to a *Rail*. Then $m : 1 :: 40 : \frac{40}{m}$; and $m : 1 ::$

700 : $\frac{700}{m}$. Now $\frac{40}{m} + 100 = 1$ Load. Hence $\frac{40}{m} + 100 : 1 :: \frac{700}{m}$

+ 2900 : $\frac{2900m + 700}{100m + 40} =$ Loads required; answering the Conditions as above.

This Mr. Lynn, though a Pitman, has performed more than many who live above Ground. Mr. Michael Taylor, of Marley-Hill, near Giffside, or near Newcastle on Tyne, proposed it with other Data. Mr. John Fryer, Master of Trinity School, Newcastle, answered it. Mr. John Cur, of Buckblades, observes, that the Number of *Posts*, and also of *Rails*, making a Load, should have been given. — Mr. Coughron judiciously observes, as the Question is stated, there will be $17\frac{1}{2}$ Loads, and 1150 *Rails* over; but for Want of the Ratio of a *Rail* to a *Post*, the Loads in 1150 *Rails* cannot be determined. Had *or*, instead of *and*, been expressed in the Question, it had been limited, and the Answer had been $64\frac{1}{2}$ Loads. Thus Mistakes are improved to Advantage.

IV QUESTION 426, answered by Mr. Thomas Adcock, of Ashby de la Zouch.

FIRST, $9 \times 4.5 = 40.5$ Inches, the Area of one Brick. Then, $40.5 : 1 :: 1296$

∴ 1296 (Inches in one square Yard) : 32, the Bricks Content in one Yard. Now, $8.476 \times 6.472 = 54.856672 \times 32 = 1755.41340$, &c. the Number of Bricks, required.

Mr. Robinson, of Biddick, gives $\frac{36 \times 36}{9 \times 4.5} = 32$ Bricks to pave 1 square Yard,

Therefore, $8.476 \times 6.472 \times 32 = 1755.4135$ Bricks, required, as before.

Mr. W. Pen, of Chalfont, gives $1755 \frac{6461}{155625}$, nearly.

Mr. John Lynn, Pitman, and Mr. George Hicks, of Reedness Free-School, Yorkshire, give 1755.413504. Gemini, of Morpetb; Mr. John Shadgell, of Ross, Herefordshire; Mr. James Muscroft, of Reiberham; Mr. John Skermer, of Ashby de la Zouch; Mr. Dalton, of Pool; Mr. Stephen Hartley; Mr. James Wood, of Newcastle; Mr. William Turner, Writing-Master and Teacher of Mathematics in Whitney, Oxfordshire; and Mr. Thomas Goodlad, of Cottingham; answered it. Mr. George Grant, Pupil to Mr. Judson, of Beverly, answered it by the universal Rule of Proportion.

Mr. Benjamin Turton, Keldeston, Derby; Mr. Alexander Rowe, of Cornwall; Mr. John Fryar, of Trinity School, Newcastle; Mr. William Wells, of Crowle, Lincolnshire; Mr. William Pearson, of North-Shields; Mr. John Curr, of Bush-blades, near Newcastle upon Tyne; and Mr. John Milne, of Howden Pass, Northumberland; all correctly answered it, by accurate and short Methods.

Mr. Congbron, of Newcastle, also solved it by $8.476 \times 6.472 \div \frac{1}{4} \times \frac{1}{2} = 1755.413504$ Bricks, required.

V. QUESTION 427, answered by Mr. Robinson, of Biddick.

LET x = Years lived since 1750; y = those before; $x + y$ = his Age; $1750 - y$, the Date he was born; therefore, $51x + 51y = 1750 - y$, per

Quest. $y = \frac{1750 - 51x}{52}$; here x must be a whole Number, suppose 18; then

$y = 16$, and $x + y = 34$ Years of Age in 1768, being born in 1734; consequently, the Age will be 37 in 1771. W. W. R.

Mr. Judson, of Beverly, Yorkshire, says his Age is 34, by the Method given to the Solution of Question XII. P. 161 of the Royal Astronomer and Navigator.

Gemini, of Morpetb, answered it nearly in the same Manner. Mr. I. Scott, of Cawthorne, answered it; as did Mr. Thomas Adcock, of Ashby de la Zouch; Mr. George Newlund, in the Isle of Wight; Mr. Charles Taylor, Pupil at Mr. Brownell's School, of Coventry; Mr. R. Dalton, of Pool; Mr. William Fen, of Chalfont; and Mr. William Taylor, of Dodworth, near Barnsley, Yorkshire.

Mr. Charles Taylor, of Mr. Brownell's School, Coventry, answers it thus. — Let x = Number of Years before 1750, y = the Number of Years after 1750.

By Question, $x + y \times 51 = 1750 - x$; i. e. $5y = 1750 - 52x$; whence,

$y = \frac{1750 - 52x}{51} = 34 - x + \frac{16 - x}{51}$, a whole Number. Whence, $x =$

$16 - 51a$; from which Equation, a must be $= 0$; whence $x = 16$, and $y = 18$: Therefore, Mr. Wells was born in the Year 1734, and is 37 Years old in 1771.

Mr.

Mr. *Alexander Rowe* puts $x =$ that Part of his Age in Years since 1750. Then, by Question, $5x \times 2x = 1750 + 1 - x$, or $102x = 1751 - x$; therefore, $103x = 1751$; whence $x = \frac{1751}{103} = 17$, and $2x = 34$; conse-

quently, $1771 - 1734 (= 1751 - 17) = 37$ Years, required.

Mr. *John Carr*, of *Busbblades, Newcastle*, answered it. As did Mr. *William Brees*, an ingenious Pupil of Mr. *Sadler's*; Mr. *William Turner*, of *Witney, Oxfordshire*; Mr. *Thomas Goodlad*, of *Cottingham*; Mr. *George Grant*, Pupil to Mr. *Judson*; Mr. *Michael Taylor*, near *Newcastle*; Mr. *William Wells*, of *Crowle, Lincolnshire*.

Mr. *William Hardy*, of *Cottingham School*, says, this Question is similar to one in the *Royal Astronomer*, and finds the Age as above.

VI. QUESTION 428, answered by Mr. John Lowe, of Birmingham.

FROM the second Equation, $y = \sqrt{6836 - x^2}$; which substituted for y , in the first Equation, and solved, $x = 44$; thence $y = 70$, the two young Maidens Ages, required.

Mr. *J. Scott*, of *Cawston, Northumberland*, by giving an Equation of the 12th Power, and its several formidable Coefficients, and finding the Root $x = 44$, (a Herculean Labour!) the Age of one young Lady; whence the Age of the other is 70, required.

Mr. *Judson*, Teacher of the Mathematics and Writing Master at *Beverly School, Yorkshires*, finds $x = \sqrt{6836 - 70 \times 70} = 44$, from whence the other young Lady's Age $= 70$. Mr. *James Wood*, of *Newcastle*, also answered it.

Mr. *Robinson*, of *Biddick*, answers it thus.

$$\text{Given Equations } \left\{ \begin{array}{l} x^2 + y^2 = 6936 - 100 = 6836 = b \\ \frac{x + x^2y + 12}{\sqrt{xy} + 56} = 2421 = c \end{array} \right\} \begin{array}{l} x = \text{Age?} \\ y = \text{Age?} \end{array}$$

$$y^2 = b - x^2; \text{ therefore, } y = \sqrt{b - x^2}.$$

$$\left. \begin{array}{l} x + \frac{\sqrt{bx^4 - x^6} + m}{\sqrt{d + \sqrt{bx^2 - x^4}}} = c \end{array} \right\} c^2 - m = n.$$

$$x + \sqrt{bx^4 - x^6} = \sqrt{cd + \sqrt{x^4bx^2 - c^4x^4} - m}.$$

$$\text{Put } p = \sqrt{4m^2 \cdot c^2 d}, \quad n - p = s.$$

$$\text{Then, } \sqrt{4bx^6 - 4x^8} + 4m^2 \sqrt{c^4bx^2 - c^4x^4} = s - x^2 - bx^4 - x^6.$$

This Equation solved, by Trial, $x = 44$, $y = 70$, required.

Mr. *John Shadgell*, (or *Shadgett*), of *Ross*, solves it thus.

From the second given Equation take $x^2 + 100$, and the Remainder is $y^2 =$

$6836x^2$; then $y = \sqrt{6836 - x^2}$; which Value of y being substituted in the

first Equation, it becomes, $\frac{x + x^2 \sqrt{6836 - x^2} + 12}{x \sqrt{6836 - x^2} + 56} = 2421$. From

whence, by Trial and Error, $x = 44$; and, consequently, $y = 70$, the two Ages.

Mr.

Mr. James Mascroft, of Rotterdam, brought out, *exactly*, the same Equation; whence $x = 44$, and $y = 70$. — Mr. John Lynn, Pitman, puts $2431 = a$; $6936 = b$; then, from the 2d Equation, we get, $y =$

$\sqrt{b-100-x^2}$ ($b = 3480$). This Value of y , Substituted in the first Equation, gives $\frac{x + x^2\sqrt{b-100-x^2} + 12^3}{x\sqrt{b-44-x^2}} = a = 2431$. (*Quere*) Reduced and solved, $x = 44$, $y = 70$. Q. E. F.

Mr. Thomas Adcock, of Ashby de la Zouch, answers it thus.

Nanny is Seventy, and no more;

Nelly indeed but Forty-four.

Mr. George Hicks, of Reedsa's Free-School, Yorkshires, determines, by Trial and Error, that the Years Mr. Wells had lived since 1750 $= 34$; consequently, $51 \times 34 = 1734$, the Date of his Birth; whence his Age, in 1772, $= 37$. W. W. R.

Mr. George Hicks, of Reedsa's, finds the second Equation, $x^2 + y^2 = 6936 - 200 = 6836$; whence (by Trial and Error) he determines $x = 44$, and $y = 70$.

Mr. Stephen Hartley gave the same Answer, by a short Process. Mr. William Bresse solved it elegantly. Mr. Ez. Walker, of Burton on Trent, Staffordshire, curiously answered it, analytically, and then by Trial and Error. Mr. Alexander Rowe answered it by a final Equation, and Trial and Error. Mr. John Fryer, of Trinity School, Newcastle; Mr. John Carr, of Busbblades, Newcastle; and Mr. William Hardy, Master of Cuttingham School, find the young Virgins Ages as above.

Mr. Congdon, of Newcastle, puts $2431 = a$; $6836 = b$; then, from the second Equation, $y = \sqrt{b - x^2}$; which put for it in the first, $x + x^2\sqrt{b - x^2} + 12 = a \times \sqrt{b - x^2}$; whence, $x = 44$, and $y = 70$, the required Ages.

VII. QUESTION 429, answered by Mr. Robinson, of Biddick.

THE Proposer does not shew how many solid Feet are contained in a Ton of Coals. With us, amongst Coalmines, it is computed, that a square Yard of Coal, or 27 solid Feet, will yield 3 Bolls of Coal Measure, which are sold for

3 Shillings. Put $x =$ Breadth; therefore, $x = \sqrt{\frac{50 \times 5}{27 \times 237.5}} = .4415$ Feet $= 5.298$ Inches.

Mr. John Lowe, of Bull-Ring, Birmingham, puts $x =$ specific Gravity of the Coal, which, by the *Philosophical Transactions*, Number 169, is 1240. Let $a =$ Length, $b =$ Depth, and $x =$ Breadth; then will $237.5x^3 = \frac{sabx}{2240}$; therefore, $x = \sqrt[3]{\frac{sab}{237.5 \times 2240}}$.

N. B. The Rule for finding the Quantity of Tons of Coal in any Vein, (*Question 429*), is shewn in most Books of *Hydrostatics*, he says. This same Mr. Lowe tells us we spelt his Name *Ton*; but it was the Paper's being cut off by Scissars, when we received it, made it appear so: And oftentimes Correspondents seal their Letters so, over the Writing, as to hinder their being read.

Gemini, of Morpeth, Northumberland, answers it thus,

Put

Put $a = 50$; $b = 5$; $c = 237.5$; and $x = \text{Breadth}$; also $d = 33.0479$

Then, by Question, $\frac{abx}{d} = cx^3$; or $ab = dcx^2$: Therefore, $x = \sqrt{\frac{ab}{dc}} =$

1784. Hence, the Content is 1.04698, and Price per Ton, 5s. 2d. $\frac{1}{2}$.

General Rule. Multiply the Length, Depth, and Breadth, in Feet, and divide by 33.0479, the Quotient will be the Tons in that Seam.

Mr. I. Scott, of Cawthorne, Yorkshire, puts $a = 500$, (and not 50, as per Data printed), $b = 5$, $c = 237.5$, and $x = \text{Depth}$. Then, per *Quest.* abx

$= cx^3$; therefore $x = \frac{\sqrt{ab}}{c} = 3.2418$; and the Content of the whole Vein

$= 8104.5$. And, by specific Gravity, one Ton of Coals $= 28.5577$ cubic

Feet; whence $\frac{8104.5}{28.5577} = 283.7933$ Tons; which, at 5s per Ton, amount

to 70l. 19s. nearly.

Remark by Mr. Cawthorne.

I am of Opinion, that to give a *general Rule*, as was required by Mr. Dalton, is impossible; because the Miners, or Colliers, are obliged to leave a Quantity of Coals ungot, for what they call *Poss*, to support the Roof; and as some Roofs require to be more, and some Posts to be less, in Quantity, that are *ungot Coals* in different Veins.

In Mr. Dalton's last Answer he puts $x = \text{Breadth}$, $a = 65$ lb. Avoirdup. in 1 cubic Foot of Coal; $b = 237\frac{1}{2}$; $m = 2240$ lb. in 1 Ton; $c = 50 \times 5 =$

250; therefore $\frac{acx}{m} = bx^3$; reduced, $x = 0.174777$; therefore $\frac{acx}{m} =$

1.268 Tons required; a *general Theorem*, which, at 5s. per Ton, $= 6s. 4d.$ W. W. R.

Mr. R. Judson, of Beverley, from Mr. Emerson's Tables of specific Gravities, by an easy Process, finds the Content $= 1.6858$ Tons, and the Value 8s. 5d. 15 +. W. W. R.

Mr. James Wood answered it, as did Mr. Alexander Rowe, with the Value of the Vein, 4s. 4d. 038; from which different Solutions there appears to be no *general Rule*, for the Reasons before assigned. Mr. Michael Taylor, near Newcastle, answered it, by the *general Rule* of the Product of the Length, Breadth, and Depth, (without Allowance for Columns or Waste,) by .07501676, for the Content in Tons. Mr. John Fryer, of Trinity-School, Newcastle; Mr. John Curr, of Busblyades, Newcastle; and Mr. W. Hardy, Master of Cottingham-School, answered it all differently; Mr. Coughron, of Newcastle, from Mr. Emerson's specific Gravities, of 78.123 lb. Avoird. to 1 cubic Foot of Coal, and 28.672 Feet in 1 Ton; putting $a = 50$; $b = 5$;

$c = 237.5$; $d = 28.672$; and $x = \text{the required Breadth}$. By *Quest.* $\frac{abx}{d}$

$= cx^3$; therefore $x = \frac{\sqrt[3]{\frac{abd}{c}}}{1} = .191606$, &c. Feet; consequently, the Con-

tent in Tons $= 1.63067$; which, at 5s. each, is 20. 4d. nearly: — Rule. The Content of any Piece of Coals, in Feet, divided by 28.672, is the Content in Tons.

VIII. QUESTION 239, answered by Mr. Dalton, of Leeds.

PUT $a = 3$ ft. $b = 4$ ft. $c = 105$ ft. and $x = \text{either Length or Breadth}$, and $y = \text{the other of them}$. For a general Solution, $xy = \text{Area}$; $ax + by = c$,

$= c$, the Money to be paid for that Area ; and $\frac{c - ax}{b} = y$; whence $xy =$

$\frac{cx - ax^2}{b} = a$ Maximum. In Fluxions, and reduced, $x = \frac{c}{2a} = \frac{171}{2}$,

and $y = 13\frac{1}{2}$; therefore $22.9\frac{11}{16} =$ the Number of Acres required.

Mr. G. Newland, of Newport, puts $x =$ the Length, and $y =$ the Breadth, in Chains ; then, per Ques. $3x + 4y = 105 = a$; and $xy =$ Area, a Maximum. From the 1st Equation, $x = \frac{a - 4y}{3}$; which put in the 2d, and the

Expression resulting put into Fluxions, we have $xy - 3yy = 0$; whence $y = \frac{a}{8} = 13.125$ Chains, the Breadth, and $x = 17.5$ Chains, the Length.

Mr. John Lums, of Ruffe, Northumberland, solves it by a similar Method to Mr. Newland's ; bringing out exactly the same Number of Chains for Length and Breadth.

Mr. N. Brownell, Master of Coountry School, answers it by a like Method ; making the Length $= 17\frac{1}{2}$, and Breadth $= 13\frac{1}{2}$ Chains, the same as above.

Gemini, of Morpeth, accurately solved it ; as did Mr. John Lowe, of Birmingham ; Mr. Robinson, of Biddick ; Mr. T. Adcock, of Abbey de la Zouch, Leicestershire ; Mr. J. Scot, of Cawthorne ; Mr. Stephen Hartley, of Sowerby-Bridge ; Mr. James Wood, of Newcastle ; Mr. G. Grant, Pupil to Mr. Judson ; Mr. G. Hicks, of Reedness Free-School ; and Mr. Alexander Rowe, who finds the Area 229.6875 square Chains, $= 22$ A. 3. R. 35 Poles.

Mr. Sadler says every square Chain costs 7 $\frac{1}{2}$ l. (because 1 in Length cost 3 $\frac{1}{2}$ l. and 1 in Breadth 4.) Therefore, as 7 : 1 square Chain :: 105 $\frac{1}{2}$ l. : 1505 $\frac{1}{2}$ l. Chains, the Land required. *A new Method of Solution.*

Mr. R. Judson, Teacher of Mathematics, and Writing-Master in Beverly School, says that this Question and Method of Solution may be seen in Fletcher's Universal Measurer and Mahanic, P. 123. Mr. Michael Taylor answers it exactly like Mr. Alexander Rowe's Numbers, confirming the same by a fluxional Method, like Mr. Daken's. Mr. John Fryer, of Newcastle ; Mr. W. Wells, of Crevalle, Leicestershire ; and Mr. W. Pearson, of North-Shields, solved it elegantly. Mr. J. Curry, of Rushbladen, Newcastle, and Mr. W. Hardy, of Cottingham, answered it ; as did Mr. W. Taylor, of Dodworth, near Barasley, Yorkshire ; and Mr. John Miller, of Horden-Pans, Northumberland, exactly.

Mr Congdon put x and y for the Length and Breadth, respectively ; then $3x + 4y = 105$, or $4y = 105 - 3x$, and $4xy = 105x - x^2$, a Maximum.

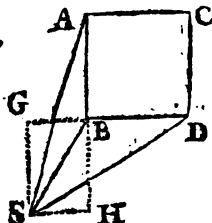
In Fluxions, and reduced, $x = \frac{105}{6} = 17\frac{1}{2}$ Chains ; and $y =$ (the $\frac{1}{2}$ of

$105 - x$) $= 13\frac{1}{2}$; therefore $xy = 22$ A. 3 R. 35 P. required.

IX. QUESTION 431, answered by Mr. Robinson,
of Biddick.

$$\left. \begin{array}{l} \text{PUT } c = SC \\ b = SB \\ a = SA \end{array} \right\} \text{ given.}$$

$$\left. \begin{array}{l} c^2 - b^2 = m \\ a^2 - b^2 = n \end{array} \right\}$$



$$\begin{aligned} \text{Ex. 2. 12. } \frac{n - x^2}{2x} &= BG = SH & \text{E. Y. 47. } AH^2 + SH^2 &= AS^2 \\ \text{And } \frac{n - x^2}{2x} &= BH = GS & \text{I. e. } \frac{a^2 + 2nx^2 + x^4 + m^2 - 2mx^2 + x^4}{4x^2} &= a^2 \\ \text{Th. } \frac{n - x^2}{2x} + x &= \frac{n + x^2}{2x} = AH & \text{or } x^4 + \frac{2n - 2m - 4a^2}{2} x^2 &= \frac{-n^2 + m^2}{2} \end{aligned}$$

a quadratic Equation, or general Rule, whence the Value of x may be easily determined. W. W. R.

Mr. John Lowe, of Birmingham, answered the same, by a quadratic Equation, but not quite so compendious as the Proposer's. Mr. R. Judson, of Beverly, elegantly answered it by a double Quadratic of the 4th Power; and remarks that it is similar to a Question proposed in the *Gentleman's Diary* for 1751 and 1752, though unknown to Mr. Hardy, as he declares; and that his own Solution is independent of any of the Solutions there given. Mr. Stephen Hartley says this Question is constructed in the *Gentleman's Diary*, p. 29, for 1751.

Mr. Alexander Rowe answers the Question thus.

LET P represent the Point given; AB (= BC, &c.) a Side of the Square; let AP = a , BP = b ; CP = c . Now putting $a^2 - b^2 = d$; and $c^2 - b^2 = e$; then

$$\sqrt{\frac{e-d}{2}} = AB = 5.968668; \text{ whence } a \approx 13, b = 10, \text{ and } c = 15\frac{1}{2}. \text{ The required general Rule is hence evident by Inspection.}$$

N. B. This Problem is of Use in Surveying, when the Square cannot be otherwise found.

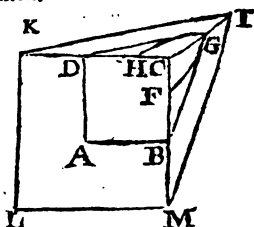
Mr. Thomas Sauter, of Whitchurch, Shropshire, puts $x \approx \frac{1}{2}$ the Diagonal of the Square; then, by 47 E. 1, $a^2 - x^2 + 2xb + b^2 = x^2$; therefore $2x^2 + 2ab \approx a^2 - b^2$; consequently, $x = \sqrt{\frac{a^2 + b^2 + \frac{1}{2}d^2}{2}} - \frac{1}{2}b$; whence

$$\sqrt{2x^2} = \text{Side of the Square.}$$

Mr. Michael Taylor answered it by a Quadratic. Mr. John Fryer, of Trinity School, Newcastle, solved it elegantly: Mr. John Carr, of Buckblades, Newcastle, answered it by drawing a Triangle round the Square, trigonometrically, demonstratively, and by Calculation.

Answered by Mr. Coughron.

Construction. Make the Square ABCD of any Magnitude; and, by Lem. p. 336, *Simpson's Algebra*, 2d Edit. describe the Arcs FG, HG, so that all Lines drawn from the Points B, C, to meet in F, G, may be in the Ratio of c to b , and from the Points D, C, to meet in HG, in the Ratio of a to b ; from their Intersection G draw the Lines BG, CG, DG, and produce CG (if Need be) till $CI = a$; and, parallel to DG, BG, draw IK, IM, and, parallel to AD and AB, KL, ML; then CKLM will be the Square required. *Demonstration.* By Construction, $b : a :: CG : DG :: CI (= b) : IK$, by similar Triangles; whence $IK = a$; and $b : c :: CG : BG :: CI (= b) : IM$; therefore $IM = c$; also, as $CG : CD$ or $CB :: CI : CK$ or CM ; consequently, CKLM is a Square.



Corollary. When the 3 Points are given in Position, (let the Figure be what it will,) the Construction will be no Way different; except that the Triangle DCB, instead of a right Angle, must be made that to be inscribed by DC, BC.

X. QUESTION 432, answered by Mr. George Hicks, of Reedness Free-School, Yorkshire.

PUT $x =$ the Side of the Square, $y =$ Side of the Cube; then $\sqrt{2x^2} =$ the Diagonal of the Square, and $\sqrt{3y^2} =$ the Diagonal of the Cube; $x^2 =$ the Area of the Square, $y^3 =$ the Solidity of the Cube; also $x^2 = 2y^2$, and $\sqrt{2x^2} - \sqrt{3y^2} =$ a Minimum, by Quest. and by Substitution, $\sqrt{4y^3} - \sqrt{3y^2} =$ a Minimum. In Fluxions, $\frac{12y^2 \dot{y}}{2\sqrt{4y^3}} - \frac{6y\dot{y}}{2\sqrt{3y^2}} = 0$; and dividing by $\frac{6y\dot{y}}{2}$, we have $\frac{2y}{\sqrt{4y^3}} - \frac{1}{\sqrt{3y^2}} = 0$. By Reduction, $3y = 1$, and $y = \frac{1}{3}$; whence $x = \sqrt{\frac{2}{27}} = \frac{1}{3}\sqrt{\frac{2}{3}}$. W. W. R.

The Proposer determined y and x to be *exactly* the same Quantities; but most of our Correspondents were out in solving this easy Question by an Inattention; one making $y = \frac{1}{3}$; another $y = 3$, and $x = 5$. &c. Mr. Stephen Hartley accurately solved it, by a Method like Mr. Hicks's above, with the same Conclusions in Numbers.

Mr. R. Dalton solved it accurately, $y = \frac{1}{3}$, and $x = \sqrt{\frac{2}{27}} = 0.2722$.

One Correspondent, after deducing $\sqrt{2x^2} = \sqrt{3y^2}$ for the true Minimum, took $2x^2 - 3y^2$ for its Square, a Minimum, (which is $2x^2 + 3y^2 - 2\sqrt{6x^2y^2}$) substituting therein, and so miscarried. We hope to be excused for a Caution given, not mentioning Names. Had our mistaken Correspondent made his Substitution in the two Radicals, and put them in Fluxions, his Numbers had come out right. — Mr. Michael Taylor, near Newcastle, answered it accurately; as did Mr. John Fryer, of Trinity School, Newcastle. Mr. Judson, of

of *Beverly* says this Question admits of both a Maximum and Minimum. He calls the Side of the Square x , the Side of the Cube y , then the Diagonal of the Square $= \sqrt{2} \times x$, and the Diagonal of the Cube $= \sqrt{3} \times y$; but $\sqrt{3} \times y - \sqrt{2} \times x$ is a Maximum. In Fluxions, $\sqrt{3} \times \dot{y} - \sqrt{2} \times \dot{x} = 0$; per Quest. $xx = 2y^3$, in Fluxions $2x\dot{x} = 6y^2\dot{y}$; therefore $x = \frac{3y^2\dot{y}}{\dot{x}}$; this substituted in the Maximum above, we have $\sqrt{3} \times y = \sqrt{2} \times \frac{3y^2\dot{y}}{\dot{x}}$; therefore $\sqrt{3} \times \dot{y} = \sqrt{2} \times \frac{3y^2}{\dot{x}}$; whence $\sqrt{3} \times \sqrt{2} y^3 = \sqrt{18} y^4$; consequently, $y = \frac{2}{3}$, and $x = \sqrt{\frac{2}{27}}$. But, for the Minimum, we have $\sqrt{2} \times x = \sqrt{3} \times y$; therefore $x = \frac{\sqrt{3} y^3}{\sqrt{2}}$, and, from above, $x^2 = 2y^3$; therefore, $2y^3 = \frac{3y^6}{2}$; whence $y = \frac{2}{3}$, and $x = \sqrt{\frac{27}{32}} = \frac{3}{4} \sqrt{\frac{3}{2}}$. W. W. R.

Mr. *James Wood*, of *Newcastle*, answered it. Mr. *John Fryer*, of *Trinity-School, Newcastle*; Mr. *W. Pearson*, of *North Shields*; and Mr. *John Curr*, of *Bushblades, Newcastle*, answered it. Mr. *Hardy*, of *Cuttingham School*, makes the DIAGONAL of the Square, or of the Cube, the greatest, and so makes both a Maximum and a Minimum. If $x =$ the Side of the Square, whose Diagonal

$= x\sqrt{2}$; and $y =$ the Side of the Cube, whose Diagonal $= y\sqrt{3}$. Whence $xx = 2y^3$; and $x\sqrt{2} - y\sqrt{3} = m$, per Quest. In Fluxions and resolved, $y = 5$, and $x = 5$: Quere? Mr. *William Taylor*, of *Dodsworth, near Barnby, York-shire*, answered it correctly by Fluxions; as did Mr. *John Milne*, of *Howden Pans, Northumberland*, concisely and correctly by Fluxions.

Mr. *Coughron*, of *Newcastle*, puts $x =$ the Side of the Cube; its Diagonal, $x\sqrt{3}$; and, by Quest. the Side of the Square $= 2^{\frac{1}{3}} x^{\frac{2}{3}}$; therefore its Diagonal $= 2x^{\frac{2}{3}}$; whence, $x\sqrt{3} - 2x^{\frac{2}{3}} =$ a Maximum, and not a Minimum. In Fluxions, and reduced, $x = \frac{2}{3}$ the Side of the Cube; and thence the Side of the Square $(= 2^{\frac{1}{3}} x^{\frac{2}{3}}) = \frac{2}{3} \times \frac{2}{3}^{\frac{1}{3}} = \sqrt{\frac{2}{27}} = .272165527, &c.$ like Mr. *Dalton's Numbers*.

XL QUESTION 433, answered by Mr. Robinson, the Proposer.

PUT $a = x + y$, and $x = xp$; then, by Substitution, in the given Equations,
 Given $\begin{cases} a^3 = x^3 + 3x^2y + 3xy^2 + y^3 \\ 2ax = 2x^2y + 2xy^2 \end{cases}$ New Equations,
 $a^3 - 2ax(x^2 + x^2y + xy^2 + y^3) = c.$

Then,

Then, $x^3 = x^2 y^3$; therefore $x^3 + x = b$. Here $x = xy = 105$.
Again, $a^3 - 210a = 6028$. Here $a = 22 = x + y$.

Also, $y = 22 - x = \frac{105}{x}$; therefore $22x - x^2 = 105$; hence $x = 15$, and

$y = 7$, required.

Mr. John Lowe (who is masterly in *Analytics*) puts $p = xy$; whence $p^3 + p = 3480$; whence $p = 15.129$. Again, $z = x + y$, and $r = x^2 + y^2$; then,

by Substitution, $\frac{z^2 - r}{2} = p = 15.129$, and $r = x^3 + y^3 + x^2 y + y^2 x = 6028$.

By Reduction, $z^3 - 30.258z = 6028$.

Therefore, $z = 17.902$ or $.817$ } Referred to Examination for the Truth.

Or, $y = .817$ or 17.902 } PALLADIUM-AUTHOR.

Mr. Richard Judson, of Beverly, answered the same, by putting $xy = p$, and

$x + y = z$; from whence, $p^3 + p = b$; and $z^2 - 2p \times z = r$; and thence proposes to determine the Numbers. — Mr. Hariley, in the first Equation, makes $x^3 y^3 + xy = 3480 = b$; whence he gets $xy = 15.1328 = a$, by solving it.

Then he puts $\frac{a}{y} = x$; which being put for x in the second Equation, he gets

$\frac{a}{y^3} + y^3 + \frac{a^2}{y} + \frac{a}{y} = 6028 = c$; which being reduced and solved, he

finds $y = .841999$, and $x = 17.97245$. W. W. R.

Mr. James Wood, of Newcastle, after the same Method, finds $x = 17.905$ and $y = .845$. — Mr. Thomas Sadler has brought out an Equation like Mr. Judson's; but refers it to others to take the Trouble to solve it.

Mr. Alexander Rowe, putting $b = 1157730$, instead of 3480 printed, (which Mr. Robinson, the Proposer, must probably help him to); also putting $xy = v$; and $x + y = z$; gets $v^3 + v = b$, from the 1st Equation; and $z^3 - 2vz = c$, in the 2d; $v = \frac{z^3 - c}{2z}$, and $u^3 = \frac{z^3 - c}{2u}$, and substituting these

Values in the 1st, $\frac{z^3 - c}{2u} + \frac{z^3 - c}{2u} = b = 1157730$; which, reduced

and brought into Numbers, gives $u^2 - 18084u^6 + 4u^3 + 99748512u^3 - 24112u^2 = 219038133952$; solved, $u = 22$; whence $v = 105 = xy$, according to Mr. Robinson; whence $x = 15$, and $y = 17$, according to Mr. Robinson's Solution; whose Difference of Numbers from Mr. Judson's and other Correspondents hence appears to be not explained by Mr. Robinson. — Mr. Michael Taylor, near Newcastle, answered it analytically and accurately; as did Mr. John Fryer, of Trinity-School, Newcastle, who found $x = 17.905$, and $y = .845$; and observes, that Mr. Holliday, in his *Syntagma Matheseos*, P. 73, has given this Question with its Solution. Mr. John Carr, of Buckblades, Newcastle, determined, by an elegant Process, $x = 17.908609$, and $y = .844952$. Mr. W. Hardy, of Cottingham, elegantly solved it by a double cubic Equation. Mr. John Milne, from Holliday's *Syntagma*, answered it. Mr. Conger, of New-

castle, from 1st, finds $xy^3 + xy = 3480$; whence $xy = 15.132$; and from the 2d, $x + y^3 - 2xy \times x + y = x + y^3 - 30.264 \times x + y = 6028$; where

where $x = 18.75$; whence $xy = 15.132$, $x = 17.905$, and $y = .845$ supposing x greatest. W. W. R.

XII. QUESTION 434. answered by Mr. Robinson, of Biddick.

PUT $C=6$, the Circumference of the Globe; which Globe being equal to two-thirds of its circumscribing Cylinder, put $p = \frac{7}{22}$, $d = \frac{22}{7}$; therefore

Cp = the Diameter of the Globe, $\frac{C^2 p^2 d}{4}$ = the Area of the Cylinder's Base;

therefore $\frac{C^2 p^2 d}{4} \times \frac{2Cp}{3}$ = the Solidity of the Globe. But $pd = \frac{7}{22} \times \frac{22}{7}$

= 1. Hence we have $\frac{C^3}{6} \times p^2 = \frac{C^2}{6} \times \frac{7}{22} \times \frac{7}{22} = \frac{C^3}{6} \times \frac{49}{484}$.

Being a General Theorem for finding the Solidity of any Globe, without using either Diameter or Radius.

Again, as the Length of the Cylinder is given 9 Inches, the Altitude of the Conoid is 18; therefore, as $18 : \frac{25}{4} :: 9 : 3.125 \times 4 = 12.5$; whose square Root = 3.5355, the Cylinder's Diameter. W. W. R.

Answered by Mr. John Lynn, of Ruffie, Northumberland.

WHEN the Diameter of a Globe is = 1, the Periphery is 6 Times the Solidity. Hence this General Rule. *The Cube of the Periphery of any Globe, divided by 6 Times the Square of the Periphery of a Globe, whose Diameter is Unity,*

will be the Solidity of the said Globe. Therefore, $\frac{6^3}{6 \times 3.1416^2} = 3.6478$, the

Solidity of each Globe.

Let $10x$ and $5x$ represent the Diameters of the Conoid.

Then, as $5x : 10x :: 10x - 9 : 20x - 18$ = the Diameter of the Cylinder;

but $20x - 18^2 \times 9 \times .7854$ = a Maximum. Fluxed and reduced, $x = .95$; the Diameters of the Conoid, 9.5 and 4.75; the Diameter of the Cylinder = 1, and its Solidity = 7.0686, &c.

Mr. George Hicks, of Readneth Free-School, very artificially determined the Content of each Globe = 3.647592, referring to *Holiday's Gunnery*, P. 37. Who determined the Solidity of the Conoid = 785.40; and the Diameter of the greatest Cylinder, that can be inscribed therein, = 5, required.

Mr. Judson, of Beverly, determines the Content of each Globe thus; as

$3.14159265^3 : .5236 :: 6^3 : 3.64757$. Then he observes, that to find the greatest Cylinder that can be inscribed in a Conoid, is the same Thing as to find the greatest Parallelogram that can be inscribed in an Ellipsis, whose Diameters are as 10 to 5, or 2 to 1. Who, by the Method of Fluxions, determines the same to be 2.528 and 2.79; but this answers not the Conditions of the Cylinder of 9 Inches Altitude, inscribed in a Conoid, of Diameters (Transverse and Conjugate) as 2 to 1.

Mr. Alexander Rowe finds the Content of the 2 Globes as above; then puts $20x - 9$ = Trans. $2b$ = 4.5 Inches = Conj. $2b$ = Cylinder's Height to be inscribed in the Conoid; $a - x$ = Distance from the End of the Cylinder to the

End

End of the Conoid ; then, by Curve's Property, gets an Expression of the Cylinder's Solidity ; which being put in Fluxions and reduced, $x = \frac{1}{2}a = 2\frac{1}{2} : 2a = 4\frac{1}{2}$, the Cylinder's Length ; and its Content, 35.7847875 Inches, required.

Mr. Michael Taylor, near Newcastle, differs in Opinion, as to the Answer to this 12th Question, who says to find the Content of Globes or Circles, without the Diameter (virtually or in Effect) is impossible. If c be the Circumference of a Globe, $a = 3.141569$, &c. then $\frac{c^3}{6a^3}$ is the Content of the

Globe ; which, when $c = 6$, is $\frac{36}{a^3} = 3.64818$. For the other Part of the

Question, or other Question, put $a =$ Cylinder's Height $= 9$, $x =$ Distance from the Vertex, $t =$ Transverse Axis. Then, by p. 354, Hutton's Mensuration, As 10 : 5 or 2 : 1 :: $\sqrt{tx+xx} : \frac{1}{2}\sqrt{tx+xx} =$ the Radius of the

Cylinder's Diameter. Whence, $.7854a \times \sqrt{tx+xx} =$ the Solidity of the Cylinder, which has neither Maximum nor Minimum ; for it will increase or decrease infinitely, as x decreases or increases.

Mr. Hardy, of Cottingham, makes the Solidity as above, and finds the Solidity of a Cylinder, whose Length is 9 Inches, and Diameter $4\frac{1}{2}$ Inches ; who remarks on the Insufficiency of the Question.

Mr. Coughron judiciously finds the Content of each required Globe 3.6475627, &c. Inches, nearly as above by Mr. Judson, and correcting the 2d Part of the Question, neither Conoid nor Spheroid admitting an inscribed Cylinder to be a Maximum.

To find the Solidity of a Cylinder 9 Inches Altitude, inscribed in a Spheroid, whose Transverse and Conjugate, being as 2 to 1, shall be the greatest. — The Solution follows. It is known the greatest Cylinder inscribed in any Curve concave to its Axis, is that whose Altitude $=$ Half the Subtangent at the Point of Contact. Whence, if $a = 4.5$, and $x =$ one of the Semidiameters of the

Spheroid, then will the Subtangent $= \frac{x^2 - a^2}{a} = 2a$, and $x = a\sqrt{3}$;

whence the Cylinder's Content, where the Spheroid is a prolate one, $= 3.1416a^3 = 286.2783$ Inches ; and, when an oblate one, $= 16 \times 3.1416a^3 = 4580.4528$ Inches.

XIII. QUESTION 435, answered by Mr. James Muscroft, of Rotherham.

FROM the 1st Equation, $y^{\frac{2}{3}} = x^{\frac{1}{3}}$, $y^{\frac{4}{3}} = x$, $y^{\frac{8}{3}} = x^2$, $y^4 = x^3$; which respective Values, substituted in the 2d Equation, give $\frac{3y^2 - 2y^2}{3y} = \frac{y^2}{3y}$; from whence $y^6 = 27y^5$, and thence, $y = 27$, and $x = 81$. W. W. R.

Mr. William Taylor, of Dodsworth, near Barnsley, Yorkshire, answered it.

Mr. Coughron, multiplying the 1st Equation by $\sqrt{x}$, gets $y^{\frac{2}{3}} + x^{\frac{1}{3}} = x^{\frac{2}{3}} + x^{\frac{1}{3}}$, or $y^{\frac{2}{3}} = x^{\frac{1}{3}}$; and, exterminating y , x by this Value makes the 2d Equation, $3y^2 - 2y^2 = 3y^{\frac{5}{3}}$; therefore $y = 27$, and $x (= y^{\frac{4}{3}}) = 81$, required.

The same was correctly answered by Mr. Robinson, of Biddick; Mr. John Lynn, of Ruffe; and Mr. Brownell, Master of Coventry School.

Gemini, of Morpeth; Mr. T. Adcock, of Asby de la Zouch; and Mr. Shadgett, (or Shadgell,) of Ross, Herefordshire, answered it thus.

The two given Equations, when brought out of Fractions, are $3\sqrt{y^2} = \sqrt{x}$, and $3\sqrt{x^2} - 2xy^2 = 2y\sqrt{x}$. By the former, $y^2 = \sqrt{x^3}$, whence the latter, by Substitution, becomes $y^2 = 3y \times \sqrt[3]{y^2}$; this Equation, reduced, gives $y = 27$, and $x = 81$.

Mr. Stephen Hartley answered it; as also Mr. James Wood, of Newcastle; Mr. Michael Taylor, near Newcastle; Mr. John Fryer, of Trinity School, Newcastle; Mr. John Curr, of Buckblades. Mr. Hardy, of Cottingham, does not pretend to solve it by a simple Equation; who says, *be that bides, can find*. Mr. Alexander Rowe, by putting $y = v^3$, and $x = u^2$, and writing their Va-

lues in the given Equations, and substituting for u in the 2d, gets $\frac{3v^6 - 2v^6}{3v^3} = v^2$; whence $3v^6 - 2v^6 = 3v^3$. $\therefore 3v - 2v = 3 = v$, and $u = 9$; whence $x = 81$, and $y = 27$.

XIV. QUESTION 436, answered by Mr. Coughron.

PUT $a = S$. Alt. at 6 $= 17^\circ 4' 15''$; S and $C =$ Sine and Cos. 28° , Half the Merid. Alt. s and $c =$ Sine and Cos. $\frac{1}{2}$ Dif. of Co-Lat. and Declinat. then $Cc - Ss = S$. Lat. $Sc - Cs =$ Sine Decl. By Spherics, Rad. (1) :

$Cc - Ss :: Sc - Cs :: a = \frac{Cc - Ss \times Sc - Cs}{SC - sc}$. Therefore $2ic (=$ Sine Dif. Co-Lat. and Declinat.) $= 2Sc - 2a =$ Sine 14° ; $\therefore$ the Latitude is 55° , and Declination 21° , answering to July 18, required.

Corollary. Hence it appears that the Sine of the Difference between the Co-Lat. and Declinat. is equal to the Sine of the Meridian Altitude, less twice the Alt. at 6. Rem. A curious Proposition, worthy the judicious Inventor.

Mr. Scott, of Cawthorne, Mr. Robinson, and Mr. Lovat, of Birmingham, answered it, analytically. Mr. Judson, of Beverly, solved it by Trial and Error, or the Rule of False; first supposing the Sun's Declination 23° , where the Error comes out $8^\circ 17' 51''$ too much; then he supposes the Declination 20° , and finds the Error $5^\circ 7' 38''$ too little: Whence, by the said Rule, and another Supposition, he finds the Latitude 55° , and Declination 21° .

N. B. He gets the Error, from considering the Sum of the Complement of Latitude and the Sun's Declination $= 90$, as they should be.

It was answered by Mr. Stephen Hartley; Mr. James Wood, of Newcastle, from Mr. Emerson's Prob. 155, p. 444; Mr. Alexander Rowe; Mr. Michael Taylor; Mr. John Fryer, of Trinity School, Newcastle, from the Method α . p. 444, Emerson's Algebra; Mr. W. Pearson, of North-Shields; Mr. John Curr, of Buckblades; Mr. W. Hardy, of Cottingham; and Mr. Taylor, of Dodsworth.

XV. QUESTION 437, answered by Mr. Robinson, of Biddlett.

$33 - 1 = 32$; which multiplied by $3 = 96 =$
 $2x$, the Number of Feet in each Rank; $b = 40$.
 $3 = 120 = EH$; $x = AH = IB$; and $c + x =$

AG. As $x : b :: c + x : \frac{bc + bx}{x} = GH$; $\therefore$

$\frac{bc + bx}{x} \times \frac{1}{c + x} = \frac{bx^2 + 2bx + bx^2}{x} =$ the Area

of the Triangle AH.

In Fluxions, $2bexx + 2b^2x^2x - bc^2x - 2bx - bx^2x = 0$. Hence, $x^3 = c^2$, and $x = c = 48$; $CD = 120$ Feet, the *Timist* must stand from the first Rank, required.

Practical Solution, by Mr. George Grant, Pupil to Mr. Judson, of Beverly. Let the *Timist* march in the Front-Line, till he can just see the Left-Hand Man of the Rear-Rank past the Right-Hand Man of the Center-Rank; then let him advance obliquely to the Front, keeping these two Men in a Line with himself; then, in any Part of that Line, after he leaves the Front-Line, every Man may see him, when advanced about 200 Paces, from the Front-Line, he will have the Perspective View required.

Mr. Coughron, of Newcastle, observes, that if eight Lines be supposed to pass through every 2 and 3 Men, the *Timist*, in any Point or Place, not situate in any one of those Lines, will be seen by all the Men; and that the 3 Ranks will also appear to him in a right Line, is evident from the Principles of Perspective. But since an infinite Number of such Points may be taken, it follows that the Problem is unlimited.

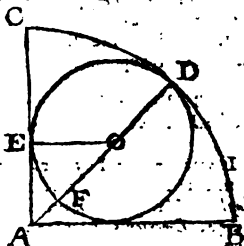
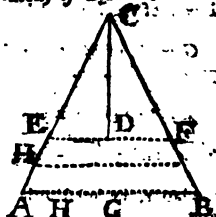
XVI. QUESTION 438, answered by Mr. Judson, of Beverly, the Proposer.

FROM the Nature of a Sphere, and of a Cube, it is easily proved that the Diameters of the 6 larger Balls are equal to the Diameter of a Circle inscribed in a Quadrant, whose Radius is equal to the Radius of the Shell, which will be found by a short Process $= 4.141$; whence 8.282 will be the Diameters of each of the 6 larger Balls. Now the Diameters of the 8 small ones (not 6, as printed) is found as follows.

By a known Theorem, As $1 : 2.1547 :: 8.282$ (Diameter of 1 of the larger Globes) : 17.846, the Diameter of a Circle circumscribing any 8 Globes, touching each other, whose Section passes through the Centers of each Globe. Therefore, in Fig. 2d, let $OB =$ the Diameter of that Circle $= 8.923$; $DC = 10$; $EB, 4.142 = c$; $OE = 8.923 - 4.142 = 4.781 = b$; call the Semi-Diameter of the smaller Globe $CF = x$; then $DF = 10 - x$; $EF = x + c$; $DE = 10 - 4.142 = 5.857$;

and $OD = \sqrt{DE^2 - OE^2} = 3.3$; therefore $OC = 10 - 3.3 = 6.6 = a$; then $FO = a - x$; But $FE^2 = OE^2 + OF^2$; therefore $c^2 + 2cx + x^2 = a^2 - 2ax + x^2 + b^2$; reduced, $x = \frac{a^2 + b^2 - c^2}{2a + 2c} = 2.3178$; therefore the Diameter of each of the

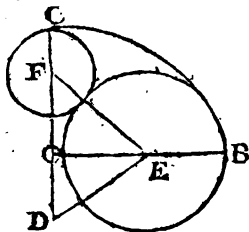
8 smaller Balls $= 4.6356$. W. W. R.



Mr. Alexander Rowe answers that.

PUT x = the Diameter of each 6 of the lar-

gest Balls; then $\sqrt[3]{x \times x \times x \times 6} = 10$; there-
fore $6x^3 = 10^3$; whence $x = \sqrt[3]{\frac{10^3}{6}} = 10$
11 006 Inches. Moreover, $20 \times 2 \div$
 $\frac{11.006 \div 6}{2} = 4.7042$ Inches = the Diamo-
ters of the lesser Balls. — Others differ from the
Proposer.



Mr. W. Hardy, of Cottingham, gives $\sqrt{\frac{D}{2+1}} = d = \frac{20}{4\sqrt{2}}$ equal to

3.284276 = the Diameter of each of the 6 equal Globes. And, by his Me-
thod of Solving *Quest. 24, Palladium 1769*, respecting the Basket and Globe,
he finds the Diameter of one of the 8 lesser Globes = 4.639871.

Mr. Chugbrow observes that the Balls will be the greatest when each touches
in the internal Surface of the Shell; and 3 of the rest; therefore it will appear
that Planes, passing through every 3 Points of the Shell where the Balls touch
it, will form an *Octaëdron*: Whence, by an elegant Process, he determines
3.284276, &c. Inches = the Diameter of each of the 6 greater Balls;
4.782966 = the Radius of the Circle passing through the Center of 3 Balls;
6.617966, &c. = the nearest Distance of the said Circle from the Shell; and
15.98821, &c. Inches = the Diameter of each of the lesser Balls.

Mr. Robinson, of Biddick, says the Bomb-Shell will contain 7 equal Balls;
who puts $b = 10$, Semidiameters, and x = the Radius of one of the Balls;

then, by an analytical Process, he determines $x = \frac{b}{3} = 3.3333$, &c. $\times 2$

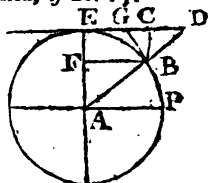
= 6.6666, the Diameter of the 7 equal Balls. Whence he determines the
Diameter of the lesser Balls, required: But his Scheme, or Figure, is too large
for Insertion, and excludes his full Answer.

XVII. Question 439, answered by Mr. Judson, of Beverly.

LET P be the North Pole, and EB the Measure
of the Latitude: and let $r = 3932$ Miles, the Earth's
Semidiameter; c = Sine Comp. Lat. then it is evi-
dent, by the Figure, when $r = 1$, that $CB = EF$

= $1 - c$; therefore $1 - c \times r$ (.398185 $\times$ 3282)
= 365.66 Miles, the nearest Distance, required.

Draw BG perpendicular to BD; then because of the
Right Angle GBD, the Angle $GBC = ADE$; con-
sequently he must be carried in an Angle with the Horizon, equal to the Com-
plement of the Latitude, to see the South Pole, or a Star in the Place thereof.
W. W. R.



Mr. T. Goodlad, of Cottingham, determined the Distance to be 1592.6 Miles
from the Earth, where the South Pole could be seen.

Mr. Alexander Rowe finds it different. *Mr. Sadler* proposes to determine
the Distance by multiplying .66164 into the Earth's Radius.

Mr. Michael Taylor, near Newcastle, makes the Distance of the Person from
the Earth to be 62032.5836 Miles.

Mr. John Fryer, of Trinity School, Newcastle, supposing this Question ambiguous, because of the Star's being at an infinite Distance, and no Distance of the Place of the Pole from the Earth given. According to the Supposition of the Star at an infinite Distance from the Earth, he determines the required Height of the Observer's Eye from the Earth to be 2633 Miles.

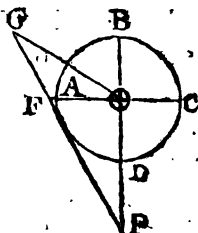
Mr. W. Pearson, of North-Shields, supposing as above, makes the Height of the Observer's Eye from the Earth equal to 2697, by a trigonometrical Process and Calculation.

Mr. John Carr, of Buckblades, Newcastle, gives 2567.732, &c. Miles the Height required, from considering the Pole nearer the Earth.

Mr. W. Hardy, of Cottingham, determines the Distance from the Earth 1583.58 Miles; so much Correspondents differ; who must re-examine their Solutions, and compare the Principles they proceed on, to find out the Truth.

Mr. Coughron's Solution.

LET ABCD represent a Meridian Circle of the Earth, P the South Pole Star, and E the Place in Lat. 53° North. Now if the Line PFG be drawn to touch ABCD, as meet OE, produced in G, it is evident that a Spectator at G may see P; but as P is at such an immense Distance from D, that PG may be justly taken as parallel to the Earth's Axis BD, $\therefore$ OF will be $\equiv$ OA, and therefore the Angle OFG is a right Angle. Whence, as the Sine OGF (Comp. Lat) : OF :: Radius (1) : OG. That is, in Words, as the Sine Complement of the given Latitude is to the Radius, or as Radius is to Secant of Latitude, so is the Earth's Radius to the required Distance from the Earth's Center $\equiv$ 2636 $\frac{1}{2}$ Miles, (supposing the Earth's Radius 3985 Miles.)



XVIII. QUESTION 440, answered by Mr. Brownell, of Coventry-School.

PUT x = Length in Feet, y = Breadth, and z = Depth; then, by Quest. $xyz = 99$ Feet, and $x + 2y + 3z$ a Maximum. In Fluxions, $x + 2y + 3z = 0$; the first Equation in Fluxions is $xyz + xyx + xzy = 0$;

from which $x = \frac{-xyz - xyx}{yz}$; which put for x in the 2d Equation, we have

$2y^2x - xyz = 0$; whence $x = 2y$, and $3yzx - xzy = 0$; whence $x =$

$3z$; then $x \times \frac{x}{2} \times \frac{x}{3} = 99$; that is, $x^3 = 594$; and $x = \sqrt[3]{594}$; $y =$

$\frac{\sqrt[3]{594}}{2}$, $z = \frac{\sqrt[3]{594}}{3}$, and its Value $\sqrt[3]{594} \times 3$, in Shillings, which is a Mi-

nimum, (instead of a Maximum,) viz. 25.21835 Shillings $\equiv$ 11. 5s. 2d. 2.48q, required.

Mr. R. Dalton, of Pool, found the Cybern's Value 21. 5s. 2d. by the Method of Fluxions, Mr. John Lowe, Master of Birmingham School, and Mr. Robinson, answered it by a similar Method; as did Mr. George Hicks.

Mr. R. Judson finds the Length 8.406, Breadth 4.2030, Depth 2.807, and Value 25.218s. $\equiv$ 11. 5s. 2d. 2.46q. Mr. Stephen Hartley answered it; as did Mr. James Wood, of Newcastle; Mr. Alexander Rowe, of Reginnis, Cornwall; Mr. Michael Taylor, of Marley-Hill, near Newcastle; Mr. John Fryer, of Trinity School, Newcastle, (who observes, that the Length, Breadth, and Depth of any rectangular Solid, sold at different Prices, and the whole, for the least Money,

thus

that the Ratio of the Sides will be reciprocally as the Prices.) Mr. W. Pearson, of North-Shield; and Mr. W. Hardy, of Cottingham, solved it.

Mr. W. Dodsworth, near Barnsley, observes, from Experience, that a Rope-Dancer, or a Dancing Master, is better rewarded than a Mathematician, or a Poet.

Remark by the Palladium-Author. It is evident that the foregoing Question admits of no Maximum; because then the greatest Depth in Feet may be infinite, or indefinite, at 3s. each, and the Length and Breadth exceedingly small, or each nearly equal to 0; so as to make a Content of 99 Feet: Whereas, in the Minimum, all the Products of the Length, Breadth, and Depth, in Feet,

(at 1, 2, at 3 Shill. each,) must be equal, or alike. Hence $x = \sqrt[3]{6 \times 99}$

$$= 3.406116; y = \frac{\sqrt[3]{6 \times 99}}{2} = 4.203058; \text{ and } z = \frac{\sqrt[3]{6 \times 99}}{3}, \text{ equal to}$$

2.802038; which, multiplied into 1, 2, 3, respectively, make $\sqrt[3]{6 \times 99} \times 3$, or three equal Products, whose Sum = 25.218348 Shillings, required.

Mr. Coughron, of Newcastle, puts a, b, c , and d , for 1, 2, 3, and 99; and x and y for the Length and Breadth: Then will $\frac{d}{xy}$ be the Depth, and $ax +$

$by + \frac{cd}{xy}$ a Minimum, (not a Maximum.) In Fluxions, $ax - \frac{cdx}{x^2y} = 0$, by

$-\frac{cdy}{xy^2} = 0$. Therefore $cd = ax^2y = bxy^2 = cxy^2 = cxyz$; or, by di-

viding by xy , $ax = by = cx$; consequently $xyz = \frac{a^2x^3}{bc} = d$; whence $x = \sqrt[3]{\frac{bcd}{a}}$

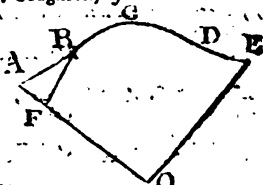
$= 3.40612$, $y = 4.20306$, and $z = 2.80204$, &c. Feet, and the required Value = 11. 5s. 2d. 2.48q. &c.

In this Manner may all such Questions be solved universally, let the Number of Quantities be what it will. When their continual Products are given, and the Sum of their Rectangles, when each is multiplied into a given Factor, for a Minimum, the required Numbers will be to one another in the reciprocal Ratio of their Factors.

XIX. QUESTION 442, answered by Mr. Coughron, of Newcastle.

LET O represent the Vertex of the Dish-Cover, and OABCDE its Form, when delineated in Plano. Put the Transverse = 16 = $2a$; the Conjugate = 12 = $2b$; the Height = 6 = c ; the Distance from the Center of any Ordinate rightly applied = x ; QB, or the Length of a Line drawn from the Vertex of the Curve to that Point in the Periphery where the said Ordinate cuts it =

y ; and AB, or the Length of the Arc of the Ellipsis, comprehended between the Transverse and said Ordinate, = z : Then, by the Prop. of the Ellipsis, &c.



Acc. we find $y^2 = b^2 + c^2 + \frac{a^2 - b^2}{a^2} \times x^2 = d^2 + ex^2$, (by putting $b^2 + c^2 = d^2$, and $\frac{a^2 - b^2}{a^2} = e$;) therefore $x = \frac{\sqrt{y^2 - d^2}}{e}$, which, wrote for it

in the Series expressing the Value of z , gives the Relation of y and z ; from whence the Relation of the Abscissa and Ordinate, AF, BF, &c. and other Properties of the Curve, may be determined; but none of them (I apprehend) simple enough for being of Use to the *practical Brazier*.

Mr. Judson sent us a Solution, with 3 Figures, (which would cost 6s. the cutting,) exhibiting the Properties of the elliptical Cover in *Plano* from the Properties of the Ellipsis; whose Semi-Transverse he determines = 9.064; and 4.735 = the Semi-Conjugate. From whence he gives (what he calls) a *practical Solution*, by Points delineated, and drawing Lines, in a prolix Way; so as to mark out the *Boundary* of the *required Curves*, by Points; but not sufficient (as we apprehend) to answer the *practical Tinner's* or *Brazier's* Purpose; nor to answer the Expence of paying for 3 Cuts; whereas one Cut had been Expence enough for such a Purpose.

XX. QUESTION 442, answered by Mr. N. Brownell, of Coventry School.

PUT $Z = \text{Hyp. Log. } x$; $B = \text{Hyp. Log. } a$; then, the given exponential

Equation will be $3xZ = \frac{By}{x}$, i. e. $3x^2Z = By$; whence $y = \frac{3x^2Z}{B}$, and

$\dot{y}x = \frac{3x^2\dot{x}Z}{B}$ = the Fluxion of the Area; whose Fluënt (by *Emerson's Fluxions*) is $Z - \frac{1}{3} \times \frac{x^3}{B}$ = Area, required.

Mr. Robinson, of Biddick, and Mr. Rowe, the Proposer, answered it. As did Mr. John Curr, of Buckblades, and Mr. William Hardy, of Cottingham.

Mr. Coughran puts c add x for the hyper. Logarithms of a and x , respectively; then will $3xx = ce^{-x}$, and therefore, $y\dot{x} = 3e^{-x} \cdot x\dot{x}$; whose Fluënt (by *Emerson's Fluxions*) is $= e^{-x} \cdot x^2 - \frac{1}{2} e^{-x} \cdot x^2 = x - \frac{1}{2} \times \frac{x^2}{c}$.

XXI. QUESTION 443, answered by Mr. Stephen Hartley, the Proposer.

PUT x = the Hypotenuse, x and y the Sine and Cosine of the Angle at Perpendicular, and Radius = 1. By Trigonometry, xx = the Base; and xy = the Perpendicular. By Question, $xy + xx = x^2x^2$, and $xx - xy = x^2y^2$; these Sum = $2xx = x^2 \times x^2 + y^2$, or $2xx = x^2$, (because $x^2 + y^2 = 1$); therefore $x = 2x$. Q. E. D.

Mr. Alexander Rowe's Answer.

LET nat. S. $\angle$ at Base = a , S. $\angle$ at Perp. = $\sqrt{1 - a^2}$, and Hyp. = $2a$. By Trig. As 1 (Radius) : $2a :: a$: Perp. = $2a^2$; and, as 1 : $2a :: \sqrt{1 - a^2}$: Base = $2a\sqrt{1 - a^2}$; whence, by Question, $2a^2 + 2a\sqrt{1 - a^2} = 4a^4$; and $2a^2 - 2a\sqrt{1 - a^2} = 4a^2 - 4a^4$; add these Equations together, and $4a^2 = 4a^2$ = the Hypotenuse squared, by 47. E. 1. Consequently,

quently, $\sqrt{4x^2} = \text{Hyp.} = 2x$. Q. E. D. N. B. *This dependent Equation proves Nothing.*

Mr. Coughron thus proves this Proposition not to be true universally. — Put $x = S.$ of the greatest acute Angle; then, if the Hypotenuse $= 2x$, the greater Leg $= 2x^2$, and the lesser Leg $= 2x\sqrt{1-x^2}$; therefore, according

to the Theorem, $2x^2 + 2x\sqrt{1-x^2} = 4x^2$, and $2x^2 - 2x\sqrt{1-x^2} = 4x^2$ — $4x^2$. This last Equation reduces to the former, being dependant Equations, or the same.

XXII. QUESTION 444. answered by Mr. Coughron.

THE square Root of the centrifugal Force is as the Cosine of the Latitude, and in the same Circle or Latitude as the Time of Revolution, *inversely*; whence if the Gravity be supposed $= 289$, the centrifugal Force in the given Latitude

will be $=$ the Square of its Cosine; therefore, as $\sqrt{289} = 17 : \text{Cos. } 50^\circ 40'$ of given Lat. $:: 23^h 56^m$, the Time of the Earth's Revolution : the required Time, when the centrifugal Force is $=$ Gravity, or the Cattle began to tumble upwards, $= 53^m 32^s .4$

COROLLARY. The Times of Revolution, when the centrifugal Force is $=$ the Gravity, are directly as the Cosines of the Latitudes; and therefore the Times of Revolution, in the foregoing Circumstance, may be found, by multiplying the Time when it happens at the Equator by the Cosine of the Latitude.

Mr. Lowe and Mr. Judson answered this Question. Mr. Hardy says, that this Question is universally answered in Fletcher's Navigation.

XXIII. QUESTION 445, answered by Mr. George Newland, the Proposer.

PUT $x =$ the Depth of the Well, $a = 16 \frac{1}{12}$ Feet, the Space descended in 1 Second, $b = 1142$ Feet, Motion of Sound in 1 Second, and $c = 3.75$ ^{Sec.} Time of Falling and of Sound ascending. As $\sqrt{a} : 1 :: \sqrt{x} : \sqrt{\frac{x}{a}}$
 $=$ Time of Descent. And $b : 1^s :: x : \frac{x}{b} =$ Time the Sound ascended

Then, by Laws of Motion and Gravity, $\sqrt{\frac{x}{a}} + \frac{x}{b} = c$; whence $x =$

$$\sqrt{bc - \frac{b^2}{4a^2}} - \frac{b}{2a} = 205.03 \text{ Feet} = 68.34 \text{ Yards, required.}$$

Mr. Coughron answered it, by a correct Process, $= 205$, &c. Feet.

Mr. Dalton puts $x =$ the Well's Depth; therefore, $\sqrt{16} : 1^s :: \sqrt{x} : \frac{x}{b}$
 $\sqrt{x} =$ Seconds of Time of the Pin's Descent; and $1142 \text{ Feet} = a : 1^s :: x : \frac{x}{a} =$ Seconds of Time of the Ascent of the Sound; now $\frac{x}{a} + \frac{x}{b} = 3.75$; reduced and solved, $x = 204.0671$ Feet, required. Mr. Scott finds 205.0321 Feet for Answer. Mr. Fen, by a similar Method, finds the Depth of the

Acc. we find $y^2 = b^2 + c^2 + \frac{a^2 - b^2}{a^2} \times x^2 = d^2 + ex^2$, (by putting $b^2 + c^2 = d^2$, and $\frac{a^2 - b^2}{a^2} = e$;) therefore $x = \sqrt{\frac{y^2 - d^2}{e}}$, which, wrote for it

in the Series expressing the Value of z , gives the Relation of y and z ; from whence the Relation of the Abscissa and Ordinate, AF, BF, &c. and other Properties of the Curve, may be determined; but none of them (I apprehend) simple enough for being of Use to the *practical Brazier*.

Mr. Judson sent us a Solution, with 3 Figures, (which would cost 6s. the cutting,) exhibiting the Properties of the elliptical Cover in *Plano* from the Properties of the Ellipsis; whose Semi-Transverse he determines = 9.064; and 4.735 = the Semi-Conjugate. From whence he gives (what he calls) a *practical Solution*, by Points delineated, and drawing Lines, in a prolix Way, so as to mark out the *Boundary* of the *required Curve*, by Points; but not sufficient (as we apprehend) to answer the *practical Tinner's* or *Brazier's* Purpose; nor to answer the Expence of paying for 3 Cuts; whereas one Cut had been Expence enough for such a Purpose.

XX. QUESTION 442, answered by Mr. N. Brownell, of Coventry School.

PUT $Z = \text{Hyp. Log. } x$; $B = \text{Hyp. Log. } a$; then, the given exponential

Equation will be $3xZ = \frac{By}{x}$, i. e. $3x^2Z = By$; whence $y = \frac{3x^2Z}{B}$, and

$\dot{y} = \frac{3x^2\dot{x}Z}{B}$ = the Fluxion of the Area; whose Fluënt (by Emerson's Flux-

ions) is $Z - \frac{1}{3} \times \frac{x^3}{B} = \text{Area, required.}$

Mr. Robinson, of Biddick, and Mr. Rowe, the Proposer, answered it. As did Mr. John Curr, of Buckblades, and Mr. William Hardy, of Cottingham.

Mr. Coughron puts c and x for the hyper. Logarithms of a and x , respectively; then will $3xx = ce^{-x}$, and therefore, $y = 3e^{-x} x a^2 x$; whose

Fluënt (by Emerson's Fluxions) is $= e^{-x} x^3 x - \frac{1}{3} e^{-x} x^3 = x - \frac{1}{3} \times \frac{x^3}{c}$.

XXI. QUESTION 443, answered by Mr. Stephen Hartley, the Proposer.

PUT $x =$ the Hypotenuse, x and y the Sine and Cosine of the Angle at Perpendicular, and Radius = 1. By Trigonometry, $xx =$ the Base; and $xy =$ the Perpendicular. By Question, $xy + xx = x^2 x^2$, and $xx - xy = x^2 y^2$; their Sum $= 2xx = x^2 \times x^2 + y^2$, or $2xx = x^2$, (because $x^2 + y^2 = 1$); therefore $x = 2x$. Q. E. D.

Mr. Alexander Rowe's Answer.

LET nat. S. $\angle$ at Base $= a$, S. $\angle$ at Perp. $= \sqrt{1 - a^2}$, and Hyp. $= 2a$; By Trig. As 1 (Radius) $1 : 2a :: a$; Perp. $= 2a^2$; and, as $1 : 2a ::$

$\sqrt{1 - a^2}$; Base $= 2a\sqrt{1 - a^2}$; whence, by Question, $2a^2 + 2a\sqrt{1 - a^2} = 4a^2$; and $2a^2 - 2a\sqrt{1 - a^2} = 4a^2 - 4a^2$; add these Equations together, and $4a^2 = 4a^2$ = the Hypotenuse squared, by 47. E. I. Consequently,

quently, $\sqrt{4a^2} = \text{Hyp.} = 2a$. Q. E. D. N. B. This dependant Equation proves Nothing.

Mr. Coughron thus proves this Proposition not to be true universally. — Put $x = S$. of the greatest acute Angle ; then ; if the Hypothenuse $= 2x$, the greater Leg $= 2x^2$, and the lesser Leg $= 2x\sqrt{1-x^2}$; therefore, according to the Theorem, $2x^2 + 2x\sqrt{1-x^2} = 4x^2$, and $2x^2 - 2x\sqrt{1-x^2} = 4x^2 - 4x^2$. This last Equation reduces to the former, being dependant Equations, or the same.

XXII. QUESTION 444, answered by Mr. Coughron.

THE square Root of the centrifugal Force is as the Cosine of the Latitude, and in the same Circle or Latitude as the Time of Revolution, *inversely* ; whence if the Gravity be supposed $= 289$, the centrifugal Force in the given Latitude

will be $=$ the Square of its Cosine ; therefore, as $\sqrt{289} = 17 : \text{Cos. } 50^\circ 40'$ of given Lat. $:: 23^h 56^m$, the Time of the Earth's Revolution : the required Time, when the centrifugal Force is $=$ Gravity, or the Cattle began to tumble upwards, $= 53^m 32^s .4$

COROLLARY. The Times of Revolution, when the centrifugal Force is $=$ the Gravity, are directly as the Cosines of the Latitudes ; and therefore the Times of Revolution, in the foregoing Circumstance, may be found, by multiplying the Time when it happens at the Equator by the Cosine of the Latitude.

Mr. Lowe and Mr. Judson answered this Question. Mr. Hardy says, that this Question is universally answered in Fletcher's Navigation.

XXIII. QUESTION 445, answered by Mr. George Newland, the Proposer.

PUT $x =$ the Depth of the Well, $a = 16 \frac{x}{12}$ Feet, the Space descended in 1 Second, $b = 1142$ Feet, Motion of Sound in 1 Second, and $c = 3.75$ Sec. Time of Falling and of Sound ascending. As $\sqrt{a} : 1 :: \sqrt{x} : \sqrt{\frac{x}{a}}$

$=$ Time of Descent. And $b : 1^s :: x : \frac{x}{b} =$ Time the Sound ascended

Then, by Laws of Motion and Gravity, $\sqrt{\frac{x}{a}} + \frac{x}{b} = c$; whence $x =$

$$\sqrt{16 - \frac{b^2}{4a^2}} - \frac{b}{2a} = 205.03 \text{ Feet} = 68.34 \text{ Yards, required.}$$

Mr. Coughron answered it, by a correct Process, $= 205$, &c. Feet.

Mr. Dalton puts $x =$ the Well's Depth ; therefore, $\sqrt{16} : 1^s :: \sqrt{x} : \frac{x}{1142}$ $\sqrt{x} =$ Seconds of Time of the Pin's Descent ; and $1142 \text{ Feet} = a : 1^s :: x : \frac{x}{a} =$ Seconds of Time of the Ascent of the Sound ; now $\frac{x}{a} + \frac{x}{1142} = 3.75$; reduced and solved, $x = 204.0671$ Feet, required. Mr. Scott finds 205.0321 Feet for Answer. Mr. Fen, by a similar Method, finds the Depth of the

the Well = 205.033 Feet. Mr. Hartley also finds it much the same by a Short Process.

Mr. George Eyre, Pupil in Mr. N. Brownell's School, and Mr. James Wood, answered it. Mr. Turner answered it from P. 258, Book IV. of *Saunderson's Algebra*, Quarto. Mr. Goodlad; Mr. George Grant, Pupil in Mr. Judson's School; Mr. Alex. Rowe; Mr. Michael Taylor; and Mr. Curr, answered it.

Mr. Hardy says this Question is similar to one in the *Ladies Diary*, concerning Eldon-Hole, in *Warwickshire*; [as it is similar to many others.] Mr. Jobb Milne answered it from *Fletcher's universal Measurer*.

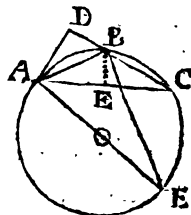
Though this Question is objected to, as not an Original, yet the Well it measures is a curious and an original Circumstance.

XXIV. QUESTION 446, answered by Mr. George Coughron.

CONSTRUCTION. Make $AD = 15$ and $2-3ds$ and erect CD perpendicular thereto; from A to DC apply $AB = 360\frac{1}{2}$, and make $CB = 199\frac{1}{2}$; then a Circle, described through the 3 Points, A, B, C , will evidently be that on which the 3 Obelisks are erected.

Calculation. Draw the Diameter AOE , also AC , BE ; then will the $\angle$ s ACB, AEB , be equal, *Euc.* 20. 3. And therefore, the right-angled Δ s ACD, AEB , will be similar. Whence, $AD : AC :: AB$

: $AE = \frac{AB \times AC}{AD}$; but $DB = \sqrt{AB^2 - AD^2} = 359.9925926$, &c. and



$AC = \sqrt{AD^2 - DC^2} = 559.9617972$, &c. Therefore, $AE = 12879.1213$ Feet = 2 Miles, 3 Furlongs, 113 Yards, 0.1213 Feet, required.

The same answered by Mr. Robinson, of Bideick.

$AB = 360.33$ Feet, $BC = 199.75$, $AD = 15.66$; 47. *Euc.* 1,

$\sqrt{AB^2 - AD^2} = BD = 359.988$; $BC + BD = DC = 559.738$. Then,

$\sqrt{DC^2 + AD^2} = AC = 559.957$. By similar Triangles, as $DC : AD ::$

$BC : BE = 5.586$. Hence, $\frac{AB \times BC}{BE} = 12886.845$ Feet, the Circle's

Diameter, required.

Mr. Scott finds the Circle's Diameter 12884.25 Feet, required.

Mr. Roberts, Mr. Hartley, Mr. George Grant of Mr. Judson's School, Mr. Alexander Rowe (from the *Gentleman's Diary*, 1769, P. 41), Mr. Michael Taylor, Mr. Pearson, Mr. Curr, Mr. Hardy, and Mr. Milne, answered it.

This Sort of Questions (more laborious than curious) is to exercise the young *Algebraist* and *Geometrician*.

XXV. QUESTION 447, answered by Mr. George Coughron.

$\frac{241.3957}{3.1416} - 25 = 20$ is the Semi-Conjugate; whence, if 25 and 20 be

put = a and b , and $\frac{1}{2}$ the Side of the required Square = x ; then will

$\frac{b^2}{a^2} \times a^2 - x^2 = x^2$; th. $4x^2 = 4a^2b^2 \times a^2 + b^2 - 1 = 975.609756 =$

Area of the Square, and its Side = $2x = 2ab = \sqrt{4a^2b^2 \times a^2 + b^2 - 1}$ equal to 31.2347, &c. Mr.

Mr. Robinson's Solution.

PUT $2b = 56 =$ the Transverse, and $2x =$ the Conjugate Diameter;

$$\text{then } 2 \sqrt{4b^2 + 4x^2} + \frac{2x}{3} = 141.3957 = c.$$

This Equation being solved, $x = 20$; therefore $2x = 40 =$ Conjugate Diameter, which put $= 2a$; then we shall have $\frac{2b \times d}{\sqrt{b^2 + d^2}} = 31.235$.

Mr. James Muscroft determines the Side of the inscribed Square $= 31.23$, (near the above Quantity.)

Mr. Hicks gives this *universal* Theorem for finding the Side of a Square inscribed in any *Ellipsis*:

Divide one Fourth of the Rectangle of the Squares of the Semi-Transverse Diameters by the Sum of the said Squares, and the Quotient will be the Area of the inscribed Square; whose Square-Root will be the Side of the inscribed Square sought.

By this Theorem he makes the Side of the inscribed Square $= 31.2$.

Mr. Judson; Mr. James Wood, of Newcastle; Mr. Michael Taylor; Mr. John Fryer, of Trinity School, near Newcastle; and Mr. W. Hardy, of Cottingham; also answered it.

XXVI. QUESTION 443, answered by Nemo, the Proposer.

HE gives for the true Answer — *Nil*.

Mr. Michael Taylor, near Newcastle, says that the Proposer being greatly out of his Latitude, he is certain that his Iron Rod will never turn if it be let fall directly perpendicular, with its Vertex downward.

Mr. Coughron also observes, that since the Vertex of the Cone is directly downwards, it must certainly continue to fall so, as its Tendency is no greater to one Side than another: *These Solutions confirming one another.*

Mr. Judson observes, that, for Want of putting his Name to every Solution and Question, (as Correspondents should do, to prevent Mistakes in collecting and transposing the Materials sent us,) Mr. W. Oliver, of Beamister, was inserted to his Solution of *Quest. 20*, the *Prize-Question*, and 3 new Questions, last Year. He expresses his Approbation of our *universal Rule of Proportion*, in last Year's *Palladium*, to this Effect. "In my Opinion it is as useful an Improvement in Arithmetic as any that has been made: This Rule is of great Use in my School, for its Plainness, Ease, and Perfection." — He subscribes for a Dozen of *Palladiums* for 1772, and Mr. Hardy, of Cottingham, near Hull, subscribes for as many, for the Use of their Pupils.

PRIZE-QUESTION, answered by Mr. George Coughron, late of Wreighill, Northumberland, but now of Newcastle upon Tyne. Feb. 26th, 1771.

THE Value of 150l. Annuity, sold for ever, compound Interest, at 4 per Cent. per Annum, is 3750l. — By *Simpson's Annuities*, Prob. X. p. 51. and Tab. 3d, p. 42, the Value of an Annuity, to continue as long as either of two Persons living, whose Ages are 32 and 37, Interest at 4 per Cent. is worth 25.85 Years Purchase; whence 3750 divided by 25.85, the Quotient will be 236l. 12s. nearly; which is the yearly Sum the Buyer must pay to the Seller, required.

Answered by Mr. Richard Judson, of Beverly.

THE present Worth of the Estate $= \frac{150}{.04} = 3750$ l. By *Simpson's Tables*

of Annuities upon Lives, the Value of the Man's Life 37 Years old $= 11.9$ Years Purchase $= m$; and the Value of the Woman's of 32 Years $= 12.7$ Years



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 Mr. says, because of its com

CORRECTIONS

- 1. fr. the Bottom, for -
- 2. from the Bottom, for
- 3. *Alexander Rowe* sends the fo
- 4. Mr. Robinson's and Mr. Cou
- 5. $40 \times 30 = 6$; $\frac{1200}{1200}$
- 6. 17 Years; and $a =$ present W
- 7. Mr. Emerson's *Algebra* B. H. P
- 8. W. W. R.
- 9. If $R = 1.02$, the rest as before
- 10. to my former Answer, at p. 33,
- 11. N. R. *W. R. Rowe* for his D
- 12. Page 34. The Answer Mr. Congbrow
- 13. with those printed; only he compared
- 14. Velocity Generated by a heavy Body falli
- 15. Page 36. Mr. Congbrow observes, that
- 16. Velocity for it is evident that the *E/ly*
- 17. Solution to *Question XIX.* in saying th
- 18. his Solidity a *Maximum*; for it is p
- 19. so find its Solidity as *small*, as you p
- 20. may be taken as *Great*, or as
- 21. Page 39. Line 25 from the Bottom, for -
- 22. Page 40. Line 29, in the Solution to Q
- 23. and not its Complement; and therefore the
- 24. Mr. Congbrow observed in his Solution last Ye
- 25. Page 42, Line 3 from the Bottom, for and
- 26. Page 43. The 3 from the Bottom, for AC
- 27. Congbrow to re-examine his own Solution, an
- 28. with that printed; and therefore concludes him
- 29. Page 49, Line 17 from the Bottom, for $\sqrt$
- 30. Page 50, Line 9 from the Bottom, for *wh*
- 31. 14 from the Bottom, for D
- 32. 12 _____, for FC
- 33. 10 _____, for *for*
- 34. 9 _____, for D

38 THE BRITISH PALLADIUM, OR
 Years Purchase = p : Put $r \approx 1.04$. Then, by a known Theorem,

$$\frac{mp}{m+p-r-1 \times mp} = 8.14 \text{ Years, the Value of their joint Continuance;}$$

and $11.9 + 12.7 - 8.14 = 16.46$ Years, the Value of the Life of the longer
 Liver. Now, to find what Annuity, to continue 16.46 Years = t , will =

3750l. Purchase = p , we have this Theorem; $\frac{pr^t \times r - pr^t}{r - 1}$ is equal to
 315.86513l. the required Annuity.

Mr. Sadler makes 236l. 2s. nearly, for the Annuity.

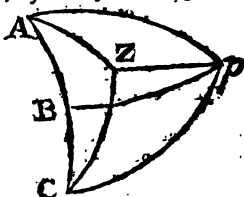
Mr. W. Hardy, of Cottingham, makes 236.539l. the required Annuity.

Grimthorpe makes 234l. 9s. 2d. nearly, each yearly Payment, by Solu-
 tions on different Principles.

N. B. Mr. Hardy's Solution nearly agrees with Mr. Coughron's.

NAVIGATION-QUESTION I. Page 69, in last Year's Palladium, proposed by
 Mr. Maskelyne, in the Nautical Ephemeris, 1771, answered by Mr. Coughron.

LET the annexed Figure represent the same
 Things as those to my Solution in Page 42,
 last Year's Palladium; then, by the same Me-
 thod which I have there used, I find $AC =$
 $41^\circ 29' 4''$, and the Angle $BCP = 85^\circ 16' 36''$,
 and from thence $\angle ACZ = 39^\circ 51' 26''$, and
 the Angle $ZCP (= ACP - ACZ) = 85^\circ$
 $25' 10''$; lastly, ZP is found = $42^\circ 26' 16''$
 = the Complement of the Latitude, and there-
 fore the Latitude itself = $47^\circ 33' 44''$; whence
 the Times of Observation are found 10h 21m 40s A. M. and 1h 11m 40s P. M.
 and therefore the Watch is 2m 20s too fast. — Lat. by Mr. Maskelyne $47^\circ 20' N$.
 (according to the Amsterdam Method, Naut. Eph. 1771) who affirmed it to be a
 Truth. — Avast!



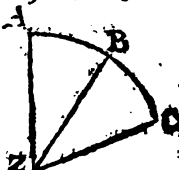
NAVIGATION-QUESTION II. in last Year's Palladium, and in the same Page,
 proposed by the same Gentleman, answered by Mr. Coughron.

BY a Process similar to the above, I find the required Latitude = 50° , ex-
 ceedingly near, and therefore the Watch 13 Minutes too slow.

Note, there is a Line left out, in proposing this Question. — Mr. Astruc
 Royal has here succeeded, and needed no repeated Operation.

QUESTION III. p. 70, proposed by the same, and answered by Mr. Coughron.

LET ABC be an Arc of the Equator, B, C, the
 Places of the Sun, and Z the Zenith; then, since the
 right-angled spherical Triangles, AZB, AZC, have
 the same Perpendicular, AZ, we shall have, as Cosine
 $ZC : \text{Cosine } ZB :: \text{Cosine } AC : \text{Cosine } AB$; and
 therefore, as Cosine $ZC = \text{Cosine } ZB : \text{Cosine } ZC$
 $+ \text{Cosine } ZB :: \text{Cosine } AC = \text{Cosine } AB : \text{Cosine}$



$AC + \text{Cosine } AB :: \text{Tangent } \frac{ZC - ZB}{2} : \text{Cotangent}$

$\frac{ZC + ZB}{2} :: \text{Tan. } \frac{AC - AB}{2} (= \frac{BC}{2}) : \text{Cot. } \frac{AC - AB}{2}$, by Lemma on P.

30 of Simpson's Trig. 2d Edit. whence, as BC, ZB, ZC, are given = 30° , $61^\circ 7'$,

and $69^\circ 18'$, respectively, $\frac{AC + AB}{2}$ is found = $30^\circ 2' 40''$, and $\therefore AB + BC =$
 25°

$75^{\circ} 1' 40''$, and $45^{\circ} 1' 40''$; consequently the Watch is 6 Seconds and a-thirds too slow. — Again, in the right-angled Triangle ZAB are known AB , and ZB ; from whence ZA is found $= 59^{\circ} 59' 31\frac{1}{2}''$ the Latitude required. — Mr. *Astronomer Royal* determined the Lat. to be $= 60^{\circ}$; which must be true, he says, because of its coming out like the fictitious one supposed, viz. 60° .

CORRECTIONS of last Year's PALLADIUM.

P. L.

31. 8. fr. the Bottom, for $-xy^2$ and $502\frac{1}{2}$ read xy^2 and $10 + 250\frac{1}{2}$ 33. 3. from the Bottom, for *computed* read *compound*

Mr. *Alexander Rowe* sends the following correct Solution to *Quest. 405*, confirming Mr. *Robinson's* and Mr. *Coughron's* Solutions, at p. 33, *Palladium* 1771.

$$\text{PUT } 40 \times 30 = b; \frac{1200 - 40}{1200} = \frac{124}{120} = \frac{31}{30} = 1.0333, \&c. = R;$$

$R = 17$ Years; and $a =$ present Worth of the Estate in Reversion. Then

$$(\text{by Mr. Emerson's Algebra, B. II. Prob. 32, Cor. I.}) a = \frac{b}{R} = 6871.48.$$

54d. W. W. R.

Cor. If $R = 1.03$, the rest as before; then $\frac{b}{R} = 7261$. or 44d. nearly

equal to my former Answer, at p. 33, *Palladium* 1771, at 3 per Cent.

N. B. *Wethank* Mr. Rowe for his Diligence and Regard to Truth.

Page 34. The Answer Mr. *Coughron* sent to *Question VI*, corresponds exactly with those printed; only he compared the Force with that of Gravity, or the Velocity generated by a heavy Body falling one Second; and they with a Body whose Velocity is one Foot per Second.

Page 36. Mr. *Coughron* observes, that Mr. *Hursley's* Solution to *Question IX*, is wrong; for it is evident that the *Ellipsis* cannot touch the Circle at the Extremity of the Transverse, as he has supposed it. He says, he is also wrong in his Solution to *Question XIX*, in saying that there is given the Base of a Cone, to find its Solidity a Maximum; for it is plain that the Solidity in such a Case may be taken as great, or as small, as you please.

Page 39. Line 15 from the Bottom, for $\frac{5}{75}$ read $\frac{5}{73}$.

Page 40. $61^{\circ} 19'$, in the Solution to *Question XII*, is the Latitude itself, and not its Complement; and therefore the *Question* was wrong proposed, as Mr. *Coughron* observed in his Solution last Year.

Page 42, Line 8 from the Bottom, for *and* read *as*.

3 from the Bottom, for AC read AB.

Page 48. The Difference of the Answers to *Question XX*, prompted Mr. *Coughron* to re-examine his own Solution, and he has found it to agree exactly with that printed; and therefore concludes his Numbers to be true.

Page 49, Line 17 from the Bottom, for $\sqrt{5+2}$ read $\sqrt{5+1}$.

9 from the Bottom, for *when* read *where*.

Page 50, Line 14 from the Bottom, for $DF + FG$ read $DF + FG \times$.

12 —————, for FG^2 read FG .

10 —————, for *simple* read *Simpson's*.

9 —————, for $DF \times DF \times DH$ read $DF \times DH$.

58 THE BRITISH PALLADIUM, OR
Years Purchase = p : Put $r \approx 1.04$. Then, by a known Theorem,

$\frac{mp}{m+p-r-1 \times mp} = 8.14$ Years, the Value of their joint Continuance;
and $11.9 + 12.7 - 8.14 = 16.46$ Years, the Value of the Life of the longer
Liver. Now, to find what Annuity, to continue 16.46 Years = t , will =

3750*l*. Purchase = p , we have this Theorem; $\frac{p r^t \times r - p r^t}{r - 1}$ is equal To
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Mr. Sadler makes 236*l*. 2*s*. nearly, for the Annuity.

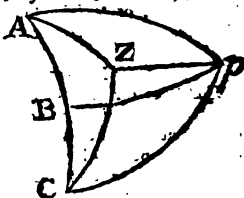
Mr. W. Hardy, of Cottingham, makes 236.539*l*. the required Annuity.

Grimshoeperis makes 234*l*. 1*s*. 2*d*. nearly, each yearly Payment, by Solutions on different Principles.

N. B. Mr. Hardy's Solution nearly agrees with Mr. Coughron's.

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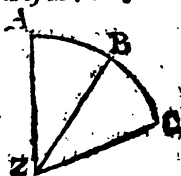
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 $ZC : \text{Cosine } ZB :: \text{Cosine } AC : \text{Cosine } AB$; and
therefore, as Cosine $ZC - \text{Cosine } ZB : \text{Cosine } ZC$
 $+ \text{Cosine } ZB :: \text{Cosine } AC - \text{Cosine } AB : \text{Cosine}$



$AC + \text{Cosine } AB :: \text{Tangent } \frac{ZC - ZB}{2} : \text{Cotangent}$

$\frac{ZC + ZB}{2} :: \text{Tan. } \frac{AC - AB}{2} (= \frac{BC}{2}) : \text{Cot. } \frac{AC - AB}{2}$, by Lemma on P.

30 of Simpson's Trig. 2d Edit. whence, as BC, ZB, ZC, are given = 30° , $61^\circ 7'$,

and $69^\circ 18'$, respectively, $\frac{AC + AB}{2}$ is found = $30^\circ 2' 40''$, and $\therefore AB + BC =$
15°

$25^{\circ} 1' 40''$, and $45^{\circ} 1' 40''$; consequently the Watch is 6 Seconds and a-thirds too slow. — Again, in the right-angled Triangle ZAB are known AB, and ZB; from whence ZA is found $= 59^{\circ} 59' 31\frac{1}{4}''$ = the Latitude required. — Mr. *Astronomer Royal* determined the Lat. to be $= 60^{\circ}$; which must be true, he says, because of its coming out like the fictitious one supposed, viz. 60° .

CORRECTIONS of last Year's PALLADIUM.

P. L.

31. 8. fr. the Bottom, for $-xy^2$ and $502\frac{1}{2}$ read xy^2 and $10 + 250\frac{1}{2}$.

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Mr. *Alexander Rowe* sends the following correct Solution to *Quest. 405*, confirming Mr. *Robinson's* and Mr. *Coughron's* Solutions, at p. 33, *Palladium* 1771.

$$\text{PUT } 40 \times 30 = b; \frac{1200 + 40}{1200} = \frac{124}{120} = \frac{31}{30} = 1.0333, \&c. = R;$$

$\&c. = 17$ Years; and a = present Worth of the Estate in Reversion. Then

$$(\text{by Mr. Emerson's Algebra, B. II. Prob. 32, Cor. I.}) a = \frac{b}{R^t} = 6871. 4s.$$

54d. W. W. R.

Gov. If $R = 1.03$, the rest as before; then $\frac{b}{R^t} = 7261. os. 4\frac{1}{2}d.$ nearly

equal to my former Answer, at p. 33, *Palladium* 1771, at 3 per Cent.

N. B. *Waitank Mr. Rowe* for his Diligence and Regard to Truth.

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———— To the End of Line 8 add *Seconds*.

XVI. *Question 367, Palladium 1768.*

The Problem to find the least Cone that will circumscribe a Solid, whose Equation is given $a^2 - x^2 \times y^3 = x^4$ is unlimited and impossible; because when $y = 0$, $x = 0$; or when x is infinite, y is so. Also $y = \frac{a}{x^{\frac{1}{3}}}$, not $\sqrt[3]{a^4}$, an *Incorrection*.

Page 55, *Palladium 1769*, $y = \frac{x^4}{a^2 - x^2}^{\frac{1}{2}}$, when $x = a$, y evidently $= \frac{a}{0}^{\frac{1}{2}}$, not $= \sqrt{a^4}$; an *Absurdity* of the Answerer.

An impertinent *Pretender* to Science, who signs *Boltoniensis*, (or *Toddienfis*, or *Smithfieldensis*,) objects to the Reasons given for a small Correction of Compound Interest, *Palladium 1768*, p. 32, 33, 34, 35, who abolishes Law and Custom, *quem paces arbitrium est, et jus, et norma*, and carps at *Palladium 1766*, p. 62, for what is maintained to be done by Mr. Emerson, p. 355 of his *Algebra*, who makes no Compound Interest for less than a Year. But this *pretending Critic* only proves his own Ignorance and Impertinence: He has not the Talents of a Cobbler, while he assumes the *Mathematician*. Such strange Creatures as he is are unfit for rational Society, and unwelcome, by their Behaviour, to Conversation or Correspondence with Gentlemen of any Class.

Κύριος ὁμῶς ἔχων. Hom. Il. I. l. 225.

Thou Dog in Forehead. Pope.

In the Letter signed as above-mentioned, the Place of Truth and Argument was supplied by impudent and ignorant Assertions, with impertinent and indecent Epithets. At the same Time we would not be thought insensible of the Defects of the *Palladium*, in general, nor of our own Defects, in particular; for the former of which we are not, nor will be, answerable. The Defect of undeserved Reproach and Ill-Manners is a greater Blemish.

———— *Pudet hæc opprobria nobis*

Et dici potuisse, et non potuisse resisti. — Ovid. Metam. I. v. 758.

Several Correspondents acquaint us that they have received anonymous Letters from London, containing a printed Libel against the *Palladium*, its Correspondents, and the Compiler thereof; who observe, that the Authors thereof (being a Work of Refinement above the Genius of one Author) have been predicting their own Fortunes!

The Nature and Dimensions of a Spiral on the Surface of the Globe, from any Point, or Latitude, to the Pole.

Though the Number of Revolutions of a Spiral (making constantly the same Angle with the Meridian) about the Pole be infinite, and performed in a finite Time, yet the Sum of all those Revolutions will be an exact and determinate finite Quantity, for the same Reason that the Sum of an infinite decreasing geometrical Progression is finite and determinate: For if a Body moves, in the first Moment of Time 10 Miles, in the second 9, in the third 8 1-tenth, and so on infinitely, in the Ratio of 10 to 9, every two succeeding Moments of Time, the whole Distance moved over by such Body will be precisely equal to 100 Miles, and not the least Quantity or Distance more or less; as may be proved by the well-known Rules for summing an infinitely decreasing geometrical Progression, as the above. — Hence, the Distance, being finite, will be moved over in a finite Time, at a certain Ratio of Motion.

A PROOF,

A PROOF, to the Commissioners of Longitude, of the Insufficiency, or great Defect, of Mr. WITCHELL's Rule, (inserted at P. 18 of the Nautical Almanac and astronomical Ephemeris, 1772), for determining the true, from the observed Distance of the Objects at Sea, for keeping a Ship's Reckoning in Longitude: According to the Palladium Author's universal and correct RULE of determining the true from the observed Distance. See the Question at P. 21 of Mr. Emerson's Appendix to his Course of Mathematics.

		Logarithms.	
Observed {	Moon from Star . . . 2 20	Constant Log. 0.3010300 of 2.	
	Moon's Zenith-Dist. 80 21 = A	Lo. Sine Corr. 0.0061891	
	Star's Zenith Dist. . 78 46 = B	Coar. 0.0084010	
Sum 161 27		Sum 0.3156201	
From the Half-Sum 80 43 30			
Subtract A, rem. 0 22 30 = C		Log. Sine 7.8157982	
Subtract B, rem. 1 57 30 = D		8.5337254	
Fr. A, sub. Dif D's Par. & Ref. 51 30			
Rem. D's true Zen. Dist. 79 49 30 = E		9.9926544	
To B, add Star's Refract. 0 4 0			
Sum, *'s true Zen. Dist. 78 50 0 = F		9.9916991	
Diff. of E and F 0 39 30 = G		Rejecting Tens 6.6494972	Sum.
89 20 30		Nat. No. corresp. 0.0004462	} take
		Nat. Cosine G 0.9999340	
True Dist. D from * 79 50 2		Natural Cosine 0.9994878	Diff.

Universally and correctly, required.

N. B. If the Star's Refraction is taken 4' 40", the Answer comes out correctly, 10 50' 4".

Arithmetically, and nearly.

Moon's Parallax in Altitude 56' 10" = P, and $\frac{1}{2}$ P = 28'

Star's Refraction in Altitude 4 0 = R, and $\frac{1}{2}$ R = 2

Sum 60 10		Half 30 5 = H, and $\frac{1}{2}$ H = 15.	
Log. Dif. 1.			
A - $\frac{1}{2}$ P = 79° 53'	225 +	X P (56' 166)	= 12637 +
B + $\frac{1}{2}$ R = 78 48	249 -	X R (4')	= 996 -
C + $\frac{1}{2}$ H = 0 37	115814 +	Sum 11641 +	
D - $\frac{1}{2}$ H = 1 42	42358 -	X H (30') = 2203680 +	
73456 +		2215321 +	
As 158172 to 2 so 2215321 to 28' 0" -		2 20 0	
		1 52 0	

General Correction.

Take $\frac{1}{2}$ of the first Correction = c = 7'.

Then, C + $\frac{1}{2}$ H, + $\frac{1}{2}$ H - c = 0° 45' | 95448 +

D - $\frac{1}{2}$ H, - $\frac{1}{2}$ H - c = 1 20 | 53541 -

41507 +

As

THE BRITISH PALLADIUM, OR

Years Purchase = p : Put $r = 1.04$. Then, by a known Theorem,

$$\frac{mp}{m+p-r-r \times mp} = 8.14 \text{ Years, the Value of their joint Continuance;}$$
 and $11.9 + 12.7 - 8.14 = 16.46 \text{ Years, the Value of the Life of the longer}$
 Liver. Now, to find what Annuity, to continue 16.46 Years = t , will =

3750*l*. Purchase = p , we have this Theorem; $\frac{pr^t \times r - pr^t}{r - 1}$ is equal to
 315.8651*l*. the required Annuity.

Mr. Sadler makes 296*l*. 5*s*. 2*d*. nearly, for the Annuity.

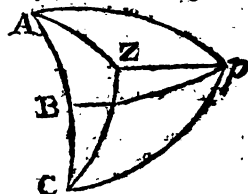
Mr. W. Hardy, of Cottingham, makes 236.539*l*. the required Annuity.

Grimshodpurvis makes 254*l*. 9*s*. 2*d*. nearly, each yearly Payment, by Solutions on different Principles.

N. B. Mr. Hardy's Solution nearly agrees with Mr. Coughron's.

NAVIGATION-QUESTION I. Page 69, in last Year's Palladium, proposed by Mr. Maskelyne, in the Nautical Ephemeris, 1771, answered by Mr. Coughron.

LET the annexed Figure represent the same Things as those to my Solution in Page 42, last Year's Palladium; then, by the same Method which I have there used, I find $AC = 41^\circ 29' 4''$, and the Angle $BCP = 85^\circ 16' 36''$, and from thence $\angle ACZ = 59^\circ 51' 26''$, and the Angle $ZCP (= ACP - ACZ) = 25^\circ 25' 10''$; lastly, ZP is found = $42^\circ 26' 16''$ = the Complement of the Latitude, and therefore the Latitude itself = $47^\circ 33' 44''$; whence



the Times of Observation are found $10^h 21^m 40^s$ A. M. and $1^h 11^m 40^s$ P. M. and therefore the Watch is 20^s too fast. — Lat. by Mr. Maskelyne $47^\circ 30' N$. (according to the Amsterdam Method, Naut. Eph. 1771) who affirmed it to be a Truth. — Avas 1

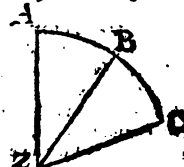
NAVIGATION-QUESTION II. in last Year's Palladium, and in the same Page, proposed by the same Gentleman, answered by Mr. Coughron.

BY a Process similar to the above, I find the required Latitude = 50° , exceedingly near, and therefore the Watch 13 Minutes too slow.

Note, there is a Line left out, in proposing this Question. — Mr. Astrucius Royal has here succeeded, and needed no repeated Operation.

QUESTION III. p. 70, proposed by the same, and answered by Mr. Coughron.

LET ABC be an Arc of the Equator, B , C , the Places of the Sun, and Z the Zenith; then, since the right-angled Spherical Triangles, AZB , AZC , have the same Perpendicular, AZ , we shall have, as Cosine ZC : Cosine ZB :: Cosine AC : Cosine AB ; and therefore, as Cosine ZC — Cosine ZB : Cosine ZC + Cosine ZB :: Cosine AC — Cosine AB : Cosine



$AC + \text{Cosine } AB :: \text{Tangent } \frac{ZC - ZB}{2} : \text{Cotangent } \frac{ZC + ZB}{2}$

$\frac{ZC + ZB}{2} :: \text{Tan. } \frac{AC - AB}{2} (= \frac{BC}{2}) : \text{Cot. } \frac{AC - AB}{2}$, by Lemma on P.

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$15^{\circ} 1' 40''$, and $45^{\circ} 1' 40''$; consequently the Watch is 6 Seconds and 2-thirds too slow. — Again, in the right-angled Triangle ZAB are known AB, and ZB; from whence ZA is found $= 59^{\circ} 59' 31'' =$ the Latitude required. — Mr. *Astronomer Royal* determined the Lat. to be $= 60^{\circ}$; which must be true, he says, because of its coming out like the fictitious one supposed, viz. 60° .

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$$(\text{by Mr. Emerson's Algebra, B. II. Prob. 32, Cor. I.}) \quad a = \frac{b}{R} = 6871.48.$$

54d. W. W. R.

Ans. If $R = 1.03$, the rest as before; then $\frac{b}{R} = 7261$. or 44d. nearly

equal to my former Answer, at p. 33, *Palladium 1771*, at 3 per Cent.

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	Moon's Zenith-Dist. 80 21 = A	Lo. Sine Corr. 0.0061891	
	Star's Zenith-Dist. . 78 46 = B	... Corr. 0.0084010	
Sum 161 27		Sum 0.3156201	
From the Half-Sum 80 43 30			
Subtract A, rem. 0 22 30 = C		... Log. Sine 7.8157982	
Subtract B, rem. 1 57 30 = D		... 8.5337254	
Fr. A, sub. Dif. D's Par. & Ref. 51 30			
Rem. D's true Zen. Dist. 79 29 30 = E		... 9.9926544	
To B, add Star's Refract. 0 4 0			
Sum, *'s true Zen. Dist. 78 50 0 = F		... 9.9916991	

Dif. of E and F 0 39 30 = G	Rejecting Tens 6.6494972	Sum.
89 20 30	Nat. No. corresp. 0.0004462	} take
	Nat. Cosine G 0.9999340	
True Dist. D from * 79 50 2	Natural Cosine 0.9994878	

Universally and correctly, required.

N. B. If the Star's Refraction is taken 4' 40", the Answer comes out correctly, 79 50' 4".

Arithmetically, and nearly.

Moon's Parallax in Altitude 56' 10" = P, and $\frac{1}{2}$ P = 28'
Star's Refraction in Altitude 4 0 = R, and $\frac{1}{2}$ R = 2

Sum 60 10			
Half 30 5 = H, and $\frac{1}{2}$ H = 15.			
Log. Dif. 1.			
A - $\frac{1}{2}$ P = 79° 53'	225 + X P (56' 166)	=	12637 +
B + $\frac{1}{2}$ R = 78° 48'	249 - X R (4')	=	996 -
C + $\frac{1}{2}$ H = 0 37	115814 +		Sum 11641 +
D - $\frac{1}{2}$ H = 1 42	42358 -	X H (30')	= 2203680 +
73456 +			2215321 +
As 158172 to 2 so 2215321 to 28' 0" -			
			2 20 0
			1 52 0

General Correction.

Take $\frac{1}{2}$ of the first Correction = c = 7'.

Then, C + $\frac{1}{2}$ H, + $\frac{1}{2}$ H - c = 0° 45' 95448 +
D - $\frac{1}{2}$ H, - $\frac{1}{2}$ H - c = 1 20 53841 -

41507 +

As

See the Steamers's Guide to the Longitude, &c. 20 0
or Key, to the Nautical Ephemeris, ...

or Key to the Nautical Ephemeris,

1 50 21
1, 50 2

Palladium-Author.

{ D Z. Dist. 8092.1' } Dist. D's Par. and Refr. 51' 30" = D.
 { * Z. Dist. 78.46 } Star's Refraction 4.0

Obs. Sum 159 7 . . . Half 79° 33' 30" L. Tan. 10.7345074
 Dif. 1 35 . . . Half 0 47 30 L. Tan. 8.1404233
 Obs. Dif. Dfr. * 2 20 . . . Half 1 10 0 L. T. corresp. 11.6011158

- 3 12⁰ Dif. Segm'ts Base 74 48 15 = Are A Ta. 10.5660465 (reject 20)
 - 35 3⁺ Dif. fr. A, left Seg. 73 38 15 Comp. 16021'45" Ref. 3'12"⁰ (sub.
 + 2'42", Emerson's Correction, 1st Correction at *.
 - 38 15 Sum, greater Seg. 75 58 15 . . Co-Fan. 9.3977119
 2°20 0 D's Z. Dist. (greater than *'s) 80.21 0 . . . Tan. 10.7694614

1 41 45 Arc D . . . 51 30 . Pro. Log. 0.5435

ad corrected

1 50 2 true Dist. Sum 1 26 33 . Pro. Log. 0.9180

1 50 2 true Diff. Sum 1 26 33 . Pro. Log. 0.9180

Difference 16 27 . Pro. Log, 1.0191

8 17 2d corrected, Dif. 1 42 45 Tan. 8.4714

Mr. Mitchell's Report.

about 4° Longitude.

Constant, Log. 9.8045

3d *Correction* not 1st . . . 9.6330 (rejecting 10)
for you cannot 20, as Mr. *Witchell* directs.

By Art. 4. Nautical Ephemeris, 1772, P. 22, Mr. Emerson's Correction at the Star (or Sun) copied by Mr. Witchell.

* Zen. Dist. app.	78° 46'	o	Log. Tan.	10.7019989	} inverting the Pro- portions in using pro. Logarithms.
Dis. fr. A aforesaid	7.3 38.	o	L. Co-Tan.	9.4677633	
Star's Refraction	o 4	o	Pro. Log.	2.6532	

Correction at *, ac-7

According to Mr. Emerson ± 2.42 Pro. Log. 1.8229 (rejecting Tens).

Witchell's Cor. there 7 — 3 12*

by *Refraction* above {

His Dif. — 5 546

§ Mr. Emerson's Difference from him, or
his from Mr. Emerson, + 5' 54".

Mr. Witchell's fourth Correction.

Sum pro. Logs. Sum & Dif. of Cor. * (or $\odot$'s) Z, Dif. & 1st Cor. ($4' & 2'.42$) 1.7501

Sum pro. Logt. Sum & Dif. of Cor. of 1st Z. Dif. & 2^d Cor. ($51'30''$ & $35'3''$) 0.6785

Log. Sine of Dist. of Objects twice corrected ($1^{\circ} 41' 45''$) 8.4697

Constant Logarithm 9.5029

Sum (rejecting twice Rad.) 4th Correction $1^{\circ}11'30''$, or $1^{\circ}11''$ Pro. Log. 0.4012

A most wonderful and inconsistent Correction, like the third!

N. B. Hence the absolute *Unfitness* of this Method of *Approximation* for the Purpose proposed is *infallibly* proved. And hence, *et cetera*, *Portsmouth Academy!*

* * See the Seaman's Guide to the Longitude, or Key to the Nautical Ephemeris, sold by Mr. D. Steel, in Little Tower-hill, for consistent, general, and

IT240

True Rules of Calculation, and for a Correction of Mr. Maskelyne's Errors and inconsistent Rules for the Longitude, published in the Nautical Almanac and Astronomical Ephemeris for 1772; correcting the Errors and Inconsistencies respecting this Sort of Calculations in other Places, made by his Assistants, for executing the Office of Astronomer Royal: who requires able Help and Judgement.

Mr. Dunthorne (in Naut. Ephem. 1772) has been so candid as to correct his Error [or wrong Rule in the Explanation and Use of the Nautical Ephemeris formerly published] that we acquainted him of in the said Key. Mr. Witchell's and Maskelyne's Rules are not worth improving, (if it can be done); and Mr. Lyon's prolix Rule none will use but himself, though recommended by an Astronomer-Royal.

Third Correction, according to Mr. Emerson's Method of Approximation.

Moon's Parallax and Refraction in Altitude 51' 30"

Moon's first Correction 35 2

Sum 1^o 26 32

Difference 16 28

Pro. Log. 0.3182

Pro. Log. 1.0386

Half, 1.3567

Little Perp. 37 45 (see Key) Pro. Log. 0.6783

Log. Tan. of same Comp. 1.9593

Half Little Perp. 18 52

Pro. Log. 0.9796

Observed Distance 2^o 20 0

Tan. 3.6102

Third Correction + 5 5 1.5490

First Correction + 2 42 not — 2' 42", as Mr. W^{ch}ell makes it.

+ 7 47

Second Correction — 35 2

Three Corrections — 27 15

Observed Distance 2 20 0

1 52 45 According to Mr. Emerson's

True Distance 1 50 2 Method of Approxima-

tion, who justly condemns

Error 2 43 these defective Methods,

as insufficient, though his

Method far exceeds those by *Witchell, Maskelyne, and others. See our Key.*

By Dunthorne's RULE, improved as follows.

Moon's app. Distance from Star 2^o 20' 0" Col. 87^o 40' N. Sine. 9991709

Star's apparent Altitude 11 14 0

Moon's apparent Altitude 9 39 0

Diff. app. Altitudes. From. 1 35 0 Col. 88 25 N. Sine. 9996182

Diff. 0.0004473

Corr^d D's Alt. 51' 30"

Log. correspondent 6.6505987

Star's Refraction 4 0

Subtr. Log. from Tab. H. 1020

Sum 55 30

Subtr. 55 30

Rem. 6.6495787

Nat. No. corresp. 0.0004462

Difference of the true Altitudes 0 39 30 Col. 89^o 20' 30" N. Si. 9999340

88 9 58 N. Sine. 9994878

Offset 1 50 2 required.

* * * The

* * The above Operation shews, that Mr. *Dunthorne's Rule* is far preferable to that by Messrs *Witchell*, *Maskeyne*, and *Lyons*, and is the only *scientific* one inserted in the *Nautical Ephemeris* for 1772, as he has there improved it, (when the Distance of Objects exceeds 90°), since we first noticed its Defect to him in our *Key* to that Work. Therefore all *Rules* to find the true from the observed Distance, in the *Nautical Ephemeris*, ought to be rejected as insufficient, except Mr. *Dunthorne's*; whose Certainty is proved in the above-unusual Instance, where Mr. *Witchell's Rule*, and the Rest, as uncertain, confused, and deficient as his, are found useless, and to fail.

See the *Seaman's Guide or Key to the Nautical Ephemeris*, for our short and correct Method of Solution by *natural Sines*. See also Mr. *Emerson's Appendix to his Course*, for his accurate, short, and easy, Solution, by *natural Sines*, proving the same as above.

NEW ENIGMAS.

I. ENIGMA 217, by the Rev. Thomas Vaughan, M. A. of Morpeth.

LADIES, a num'rous Race does you accost,
Who no high Origin could ever boast.
On Land and Water frequently we're seen,
And often sport upon the flow'ry Green.
Sometimes we fly about in open Air;
But that, you may believe, is very rare.
We dwell in *France*, in *Spain*, in *Germany*,
In *England*, *Scotland*, *Holland*, *Italy*;
In *Portugal*, in *Sweden*, *Prussia*, too;
In *Turkey*, with the *Russian Army* now.
As to our Colours, they are only mean;
In them there is but little Beauty seen.
This Hint conspicuous take — We once were wet
In the Heart's Blood of a *Scotch Baronet*.

II. ENIGMA 218, by the Rev. Thomas Vaughan,

ÆNIGMATISTS, would you incline,
We're sure that you can make us shine;
Then, pray, upon us shew your Wit,
For we are for Ænigmas fit.
Of diff'rent Shapes and Forms we're made,
By Artists who are skill'd in Trade,
Of Steel or Brass we oft appear;
At other Times, in Silver clear:
Sometimes of Box-wood, Broom, or Yew;
Of Horn, of Bone, and Iv'ry too.
We oftentimes on Hinges move,
Also with Screws, when you approve.
One Night there is, in ev'ry Year,
When Numbers of us do appear;
When we are forc'd to toil and work,
And labour hard like any Turk.
The Young without our Help can do;
But with the Old it is not so:
Without our Aid, they needs must own,
Of that Night's Dainties they'd taste none.
And, farther, take it for a Fact,
Without Assistance we ne'er act.

III. ENIGMA

III. ÆNIGMA 219, *by Gemini, of Morpeth.*

SOME ascribe me to the Fair,
 As their most peculiar Care;
 My Existence some deny;
 Let them view the *spangled* Sky,
 When the Weather is serene,
 I apparently am seen.
 So with Meads in blooming *May*,
 When the Flow'rs are fresh and gay.
 The *Palladium* too, each Year,
 Makes me plainly to appear.
 At a Midnight Ball I'm seen;
 Oft'ner on the sportive Green;
 'Midst the blooming lovely Fair,
 Easy, free, and debonnaire.
 Health and native Liberty
 Join in the Support of me.
 Quite in vain are human Arts;
 Nature only me imparts.
 Though I very rare am found,
 Ask the World, and I abound.
 In the Form, or Face, or Mind,
 Each pretends my Charms to find:
 'Tis *Self-Love* instead of me;
 Then say, *Adopt*, what I be.

IV. ÆNIGMA 220, *by Mr. W. Swift, of Stow.*

FIVE Letters do contain my Name;
 Forward, or backward, reads the same.
 An *Instrument* you'll find I'm made,
 And useful in the *Mason's* Trade.

V. ÆNIGMA 221, *by Mr. Swift.*

THREE Letters will my Name explain,
 If you these Letters can obtain;
 And that you soon may find me out,
 Like Fruit I grow, is past a Doubt.
 The Ladies Mirth from me partake;
 Their Jokes I often help to crack.
 My Name revers'd, you'll find, I strait
 Become a Measure and a Weight.

VI. ÆNIGMA 222, *by Mr. Swift.*

FOUR Letters form a *Scripture* Name,
 (Each Half of Letters is the same,)
 Strait, or reverse, if read, you'll see
 The nearest Kin I have to me.

VII. ÆNIGMA 223, *by Mr. J. Scott, of Cawthorn, Yorkshire.*

CROSS made am I, prone to perplex,
 Though not in ev'ry Country found:
 My Aid I give to either Sex,
 As, in my Duty, I am bound.
 On *Alexander*, fam'd the Great,
 Whose Charms all *Asia* did subdue,
 I always did attendant wait,
 Whatever Schemes he had in View,
 Sagacious Geniuses I try,
 In curious Speculations;

Show *Emerson* a Reason why

He makes his Operations.

Coughron, Hardy, Rowe, and others I know,

Expertly can me exercise :

But those, I protest, who handle me best,

Will stand a good Chance for the *Prize*.

VIII. *ÆNIGMA* 224, by *Mr. Nicholson*, of *Newport*, in the *Isle of Wight*,
STANDING on *Piquet*, which the *Soldiers* dread,

Brings me to *Life*, who just before was dead.

Hanging, on wicked *Counsel*, oft does fall ;

But I, *unbung*, can shape no *Course* at all :

Yet, soon as hung, I scamper to and fro,

Looking out sharp around me as I go ;

And though I have no *Eyes*, I cannot rest,

Until I find the *Flow'r* that I love best :

So *Sophy* likes her *Lover*, still reclin'd

Upon her *Breast*, and never proves unkind.

None to his *Friend* more constant is than I ;

Yet none more wav'ring underneath the *Sky* :

Though for my *Constancy* I noted be,

Yet fickle *Mortals* learn to rove from me.

All *Parts* of *Earth* and *Seas* I travel round,

Yet I at *Home* am always to be found.

Say then, dear *Ladies*, what I am ; for you,

Or none, can prove such *Contradictions* true.

IX. *ÆNIGMA* 225, by *Miss H—y*, of the *Isle of Wight*,

MY *Shanks* unto my *Shoulders* join ;

Upon my *Lips* I stand ;

No *Lady* (be she e'er so fine)

But takes me in her *Hand*.

Whoever sends the best Answer, in Verse, to the following *Ænigma*, before
Candlemas-day next, has a Chance, by *Lot*, to win 5, 4, and 3 *Palladiums*.

PRIZE-ÆNIGMA, by *Mr. Sadler*, of *Whitchurch*.

MY *Parent* was taller than bold *Robinhood*,

And liv'd many *Years* by the *Side* of a *Wood* :

In *City* and *Country* I often abide ;

Dwelt with an old *Woman*, close by the *Road-Side* ;

I'm great and I'm little, I'm round and I'm long ;

I'm active and passive, and sportive and strong.

Both above and below I'm belted quite round,

Long *Journeys* I travel, yet pass little *Ground*.

My *Belly's* capacious, and *Mouth* opens wide,

I run without *Legs*, work without *Arms* beside.

I've a *Hat* that is large, and far round does expand,

And my *Crown* is quite open, to put in your *Hand*.

Two *Ears* I have got, seated next to my *Mouth* ;

And attended I am both by *Age* and by *Youth*.

Sometimes an *Engagement* I have with *Friend Roger* ;

At his *House*, my dear *Sophy*, I'm always a *Lodger* :

In the *Combat* he toils, 'till the *Sweat* at his *Nose*

Trickles down to his *Beard*, and from thence to his *Nose's*

And when I've a *Frolick* with *Mrs. Ann Woodle*,

She jerks me about as she works with her *Needle* :

Whose *Jerks* oft repeated, she makes me run a'er,

And belpatters her *Linen* all over before,

In my Belly a nimble One's often confin'd :
 I trouble the fair One, and torture the Mind.
 A Chaos I hold, of some thick and some thinner ;
 And help to provide *Sophy Horner* a Dinner.
 A Production from me springs to Form very soon,
 And my Child that comes forth much resembles the Moon.
 My Motions, in Labour, are strange, you must know ;
 I tols, tumble, bounce — You may tell *Polly Stow*.
If these are Riddles, Quirks, and Puns,
Let Sophy tell her Fav'rite Ones.

Mr. Lacey's *Enigma*, of *Bridport*, and Mr. Nicholson's, of *Newport, Isle of Wight*, could not come in this Year ; nor others of Merit.

NEW QUERES.

I. QUERE 222, by Mr. Geo. Hicks, of *Reedness Free-School*.

UPON what Part of the terraqueous Globe has a Ship the least Pressure upon the Water ?

II. QUERE 223, by Mr. G. Grant, Pupil to Mr. Judson, of *Beverly*.

AS Churches, in general, (excepting those built of late Years,) decline, more or less, to the North-West, and South-East, may it not with Propriety be supposed, that when these were first built, they stood then due East and West ? And, from the present Declination of any particular Church given, may not the Date of its Building be nearly determined ?

III. QUERE 224, by *Historicus*.

WE read in *Herodotus*, (*Erato*,) that, when it was objected to *Demaratus*, King of *Sparta*, by his Rival *Leutychides*, that he was not the Son of *Arifson*, his reputed Father, but a supposititious Child, he conjured his Mother, in a solemn Manner, to reveal the Truth : Who, in Answer, observed to him, that his Enemy framed the Objection merely because he was born before the Expiration of ten Months ; but that the Infatuation was suggested by Ignorance ; for Women, she remarked, were not always so late in their Delivery ; some Children having been born at the End of nine Months from their Conception, and some even at seven. — From this Story, be it true or false, it appears that a Child of nine Months was judged an early Visitant in *Græce* ; at least, by the Historian. — Quere, are the Women of any Country (particularly in that Part of the World) known generally to exceed that Term, or not ?

IV. QUERE 225, by the same Correspondent.

WITH what Propriety is the Expression, *equivocal Generation*, substituted for *Spontaneous Generation*, by *Boyle*, *Ray*, *Derham*, and other Writers in Natural Philosophy ?

NEW REBUSES.

I. REBUS, by Mr. G. Lacey, of *Bridport*.

To a Weapon, much us'd by the fly Archer *Cupid*,
 A Part of the Face must be join'd ;
 Which done, with much Ease, unless you are stupid,
 A Town's Name of Note you will find.

II. REBUS, by Mr. Nehemiah Truby.

To a Monarch, who Kin to *Pendragon* did claim,
 For his Valour renown'd in the Annals of Fame,
 Join a Bird, that with us in the Summer abides,
 And builds her Nest openly on our House Sides ;
 'Twill shew you a Noddy, in ample Proportion,
 Who, addling, studied perpetual Motion ;
 Who was once a Booseller, and Maker of Hats,
 And could prognosticate by the Owls and the Bats ;

THE BRITISH PALLADIUM, OR

Who, for sping Sage *Marlin*, is now, as we judge it,
Transform'd to a *Tinker*, and carries a *Budget*.

III. REBUS, by the Rev. Thomas Vaughan, M. A. of Morpeth,
THREE *Fourths* of a *Fence*, and three *Fourths* of a *Line*,
And Half a *King's* Name, in the Scriptures divine;
Then add a *strong Accent*, and there will be found
A *Baronet's* Seat fam'd *Northumberland* round.

IV. REBUS, by Gemini, of Morpeth.

TO two *Fifths* of an *Insect* for Industry fam'd;
Join two *Fifths* of that *Worth*, when *true Greatness* is nam'd;
And what a *right Heir* is, as soon as he's born;
'Twill shew you *who* much does this Nation adorn.

V. REBUS, by Mr. John Bailey, of Middleton, Yorkshire.

TO a *Cardinal Point*, join the *Sign* of a *Fold*,
And a *Town's* Name in *Kent* it will plainly unfold.

Mr. Michael Taylor sent 2 new *Rebuses*, which, for Want of their Solutions being explained, cannot be inserted.

NEW PARADOXES.

I. PARADOX, by Mr. George Newland, in the Isle of Wight.

A Port, B, bears due *West* 40 Leagues from the Port A; yet a *Ship*, sailing from the Port A due *West* 40 Leagues, arrives not at the Port B.

II. PARADOX, by Oedipus.

IN all my Engagements I do what I can;
I engag'd with a Lady, and made her a Man.

The Paradox, sent us by Mr. Bayley, concerning the making a *Harlot* an honest Woman, &c. has been proposed and answered in a former *Palladium*.
— The Genealogy and History of a *Witch* hereafter.

NEW QUESTIONS.

I. QUESTION 450, by Mr. John Shadgett (or Shadgett) of Ross, Herefordshire.

NEAR *Severn's* Banks, in *Albion's* Isle,

Where rural Sports the Hours beguile,

There dwells a Lady of Renown,

Whose Virtues all her Actions own;

Her beauteous Form and lovely Face

Proclaim her Goddess of the Place.

From what's annex'd, * I make no Doubt,

You'll find her *Age* and *Fortune* out.

$$*x^2y^2 + x^5 = 29030401312 + y$$

$$\frac{x^4}{y} + x^3 = 13310.$$

Wherein *x* represents her Age, in Years, and *y* her Fortune.

II. QUESTION 451, by Mr. William Pen, of Chalfont.

A Person spent, at a Tavern, 10 s. the 1st Day, 9 s. 6 d. the 2d, &c. at the Rate of 5 per Cent. less every Day than on the former Day: What Sum of Money did he spend?

III. QUESTION 452, by a Watchmaker in Northumberland.

A Clock has 2 Hands; one of which goes round in 1 Hour and a Half, and the other in 1 Hour and 2-3ds; Required, from thence, the exact Time of the Day, or Distance of Time, when the said Hands will be directly in Opposition to each other; next after their setting out together at 12 at Noon, and both moving the same Way. Also, required the exact Time of their Meeting, supposing them to move at the same Rate, the contrary Way, from the same Time of setting out together.

IV. QUESTION 453, by Mr. Robinson, of Biddick.

$$\sqrt{x} + y\sqrt{z} = 1730.$$

$$\sqrt{y} + x\sqrt{z} = 1466.$$

$$x\sqrt{z} + x\sqrt{y} = 42.$$

} Required the Values of *x*, *y*, and *z*.

V. QUESTION 454, by Kilwin, Northumberland.

TO find *three* Numbers in *musical* Proportion, whose *Product* is = 43 such, that if the 1st be added to *b*, the 2^d subtracted from *c*, and the 3^d divided by *d*, the Numbers thence arising shall be in *geometrical* Proportion.

VI. QUESTION 455, by Gemini, of Morpeth, Northumberland.

A cylindrical *Milk pail* there is to be made,
To hold just *three* Gallons, to please the *Milk-Maid*,
With Wood of *least* Weight. or as light as can be:
The *Dimensions* describe to the *Corper*, or me.

VI. QUESTION 455, by Mr. John Lynn, of Ruffie, Northumberland.

$$\left. \begin{array}{l} \overline{x+y}^{\frac{1}{2}} + \overline{xy}^{\frac{1}{2}} = a. \\ x^2 + y^2 = b. \end{array} \right\} \text{ Required } x \text{ and } y \text{ by a Quadratic ?}$$

VII. QUESTION 456, by Mr. James Wood, of Newcastle.

WHAT *three* Numbers are those, whose *Sum* is 19, *Product* 240, and *Sum* of the *Squares* 125?

VIII. QUESTION 457, by Mr. Thomas Goodlad, of Cottingham, near Hull.

A Sphere of *Wood*, swimming in *Rain-Water*, had $\frac{1}{3}$ of its *Superficies* above the Surface; but, swimming in *Milk*, it had $\frac{1}{3}$ of its *Superficies* below the Surface. Required its *Diameter*.

IX. QUESTION 458, by Mr. Judson, of Beverly.

REQUIRED the *Diameter* of 4 *Spheres* inscribed in a *Cone*, whose *Altitude* is = 10, and the *Diameter* of its *Base* = 30 Inches; three of which shall touch each other, the *Base* and *Sides* of the *Cone*; and the *fourth* shall touch the other *three* *Spheres* and *Sides* of the *Cone*. Also, required the *Diameter* of the *least* *Punch-bowl* (being a *Semi-Globe*) that will just cover the first *three* *Spheres*.

X. QUESTION 459, by Mr. Pen, of Chalfont.

A Man has a *Piece* of *Ground* in triangular Form, whose *Sides* are in Proportion, as 2, 3, and 4, and the *Area* is one *Acre*: Required the *Sides* thereof.

XI. QUESTION 460, by Mr. George Hicks, of Reedness Free-School, Yorkshire.

IF the *Perpendicular* of any right-lined right-angled *Triangle* be equal to *twice* the *Sine* of the greatest acute Angle, the *Sum* of the *Legs* will be equal to the *Square* of the greater Leg; and their *Difference* equal to the *Square* of the lesser Leg. Required the *Demonstration*.

XII. QUESTION 461, by Mr. James F—r, of Newport, in the Isle of Wight.

TO divide a right-lined *Triangle* into 4 equal and similar *Parts*: And to give an *ocular Demonstration* to 32. *Prop. 1. Euclid*, independent of all other *Propositions*.

XIII. QUESTION 462, by Mr. Robinson, of Biddick.

REQUIRED the *Dimensions* of the *least* circumscribing *Ellipsis* to a *Parallelogram*, whose *Length* is 36, and *Breadth* 30, Inches.

XIV. QUESTION 463, by Mr. Alexander Rowe, of Reginnis, Cornwall.

A Gentleman, of 68 Years of Age, made his *Will*, in which he gave his 2 Nephews 4000*l.* viz. 2400*l.* to the eldest, of 23 Years of Age, and 1600*l.* to the youngest of 18, conditionally, that if either of them should die before him, the whole should fall to the *Survivor* of the two, after his Death. Required the *Values* of the *respective Expectations*, from the *Date* of the *Will*, the *Interest* of *Money* being admitted $3\frac{1}{2}$ per Cent.

XV. QUESTION 464, by Kilwin, Northumberland.

$$\left. \begin{array}{l} x^2 + \sqrt{y^2 - x^2} = 623.4595 \\ y^2 - \sqrt{y^2 + x^2} = 89699.4605 \end{array} \right\} \text{ Required the Values of } x \text{ and } y, \text{ a Lady's Age and Fortune.}$$

XVI. QUESTION 465, by Mr. Breece, of Adderly, late *Pupil* to Mr. Sadler.

THE BRITISH PALLADIUM, OR

IN a Pump Tree, how deep must an *Augur* just bore,* } * $3\frac{1}{2}$ Inches Diameter
For the Solid Content of a Foot, and no more ?

XVII. QUESTION 466, by Mr. William Broeze.

A Silver Snuff-Box is made in the Form of the middle Zone of a Sphere, whose internal Solidity is 9.3295 Inches; the Top and Bottom Diameters are equal, and the Difference of the Sum of the Diameters, and Height (or Depth) of the Box = 4 Inches: Required the Dimensions thereof.

XVIII. QUESTION 467, by Mr. Michael Taylor, of Marley-Hill, Newcastle.

AT a certain Place in North Latitude, the Sun rose at $3^h 59^m 24^s$, and his Depression at Midnight was $70^{\circ} 37'$ with North Declination Required the Latitude where, and Day of the Year, 1771, when, this happened.

XIX. QUESTION 468, by Miss Polly Stow.

AT an independent Election, the Bill for all Expences came to 1221*l.* 11*s.* 1*d.* 1*q.* each Elector paid alike to a Farthing: Required the least Number of Electors, and what each Elector paid, without a Fraction.

XX. QUESTION 469, by Mr. George Newland, of Newport.

IF the Cavity of a Pair of Bellows, full of Air, be 240 cubic Inches, and they be compressed together in 1 Second of Time, required the Velocity of the Air through the Spouts of those Bellows.

XXI. QUESTION 470, by Quarter-Master Thorp.

TO find the sexagesimal Quantity, whose logarithmic Tangent shall be = 0; a Quantity less than any assignable.

Whoever sends the best Answer to the following Question, before the 1st of March next, shall be entitled, by Lot, to 12 Palladiums.

PRIZE QUESTION, by Quarter-Master Thorp.

TO determine the Ratio of the Number of solar and lunar Eclipses that generally happen. Also to determine the greatest Duration possible of a solar and lunar Eclipse.

Several Correspondents send us Questions with expensive Cuts to be cut; and others of the same Things over and over again, (like Questions of Ladies Ages and Fortunes), sickening the Reader, and showing a Dearth of Invention; which, therefore, cannot be inserted. Things of Novelty and Variety are wanted; plain and useful, and such as can be applied to Practice in the Affairs of Life.

N. B. Finding the Latitude to the middle Time of a distant Observation, by the Watch, at Sea, (allowing for the Ship's Motion,) to be shown hereafter — With an Answer to the Hoc-Carriers and Longitude Calculators, executing the Office of Astronomer-Royal, who deny the Possibility of observing the Eclipses of Jupiter's Satellites with Glasses of certain magnifying Powers, with which they have been observed.

Prizes won.—Mr. Coughron, of Newcastle, is desired to send for 12 Prizes R. Palladiums; Gemini, of Morpeth, for 4 Prizes Æ. Palladiums; Mr. Nicholson, of Newport, in the Isle of Wight, for 3 Prizes Æn. Palladiums; and Oedipus, of London, for 5 ditto, in their own Names and Hand-Writing, to Mr. Cole's, Mathematical-Instrument-Maker, in Fleet-Street, London.—Mr. Hardy, of Cottingham, is desired to send for 3 Palladiums.

PROMOTIONS dans les RÉGIONS LUNAIRES.

1. LE Révérend Docteur O Piper, ancien Bossleman du Cheval-Marin, élevé à être grand Critique en Astronomie, Longitude, et Navigation, et Observateur grandissime en l'Observatoire de sa Majesté la Lune.

2. Monsieur le Chevalier D'On, Connoisseur et grand Calculateur des Transits et Eclipses, Trisé en Astronomie néeromantique.

3. Mynheer Casse Harden, Hattonienfis, autrefois Secrétaire de l'Office des Libels dans la Lune; maintenant élu grand Maître de la Sanction Pragmatique, et de la Société des Catamites; et encore Fauteur d'Appendices et Index aux Messieurs de l'Académie de Gotham.

4. Signior

4. *Signior Babonichis*, le Père des Muses *Smithfieldiennes*, érigé en *Rôteur* d'Impudence et de l'Art de *Contradiction* au Collège du *Nex-d'airain* dans la Lune.

5. *Madame Sophie Vagabonde de Vitebit*, avec tous ses anciens Titres et Emplois, élevée au degré de *Première Montreufe* du François d'un *Clinicallier*, à l'*Académie des Complimens* sur le *Saffron-Hill* de la Lune.

6. Monsieur le Chevalier de *Vitebit*, aux Bas de Soye, et de l'Ordre des *grandes Calottes*, confirmé *Surintendant* et *Régulateur général* des *Pathiques* et *Cosus*.

7. Le *Boucher sanguinolent* des *Cochons* pour les Juifs, reçu comme *Premier* dans le Corps des *Volcurs de Nuit*, *Affassins*, et *Libelleurs*.

Those Gentlemen and Ladies, who are pleased to favour the *Palladium-Author* with their Names and Atchievements, (as many others have already done), shall be recommended for *Promotion* in their Turn, according to their several Degrees of Merit.

INSPECTOR-GENERAL.

* * A certain Set must excuse us for rejecting all Sorts of Connexion or Acquaintance with them, and for not being angry at their *Personalities*; to whom we recommend their following better *Precepts* and *Practice*.

The best Defence in Reason, we conceive,

Is so to act, that None shall Ill believe.

Make none your Friend, till you have prov'd him true;

Your Mind, disclos'd, may be expos'd to View;

Acquaintance you'll find many — Friends but few.

A Friend in Pocket you will find the strongest,

Not apt to vary, and will last the longest.

}

For Information concerning *Ruffians*, *Libellers*, &c. see *The General Evening Post*, sold by *S. Bladon*, Number 28, *Pater-noster-Row*, from *Saturday March 9*, to *Tuesday March 12*, 1771, Extract of a Letter from *Portsmouth*: And the same Paper, sold by ditto, from *Saturday March 16*, to *Tuesday March 19*, following, a Paragraph relating to *Ruffians* at *Portsmouth*, in our *Chronicle*.

Of REPUTATION and FAME.

Commend not, till the Man is thoroughly known:

Applause misplac'd, you make the Faults your own.

All are not Halleys, to command our Praise:

What Alterations shams us since his Days!

1. THE Gifts (scattered by *Fortune*, *Birth*, *Titles*, *Honours*, *Riches*, and *Preferment*,) are in our Possession; but *Reputation* and *Fame* are in the Possession of others.

2. *Reputation* and *good Fame* are the Foundation of *laudable Actions* and *glorious Undertakings*.

3. *Reputation* is a *Jewel*; gained with *Difficulty*, and lost with *Ease*.

4. It is the *good Opinion* that others have of our Merit.

5. *Reputation* is like *Credential Letters* of Recommendation.

6. It is several Ways acquired, from the *Perfections* of *Body* or *Mind*; *Activity*, *Address*, *Politeness*, *Prudence*, *Justness of Dealing*, *Ability*, *Integrity* in *Office*, &c.

7. *Applause* is less durable than *Reputation*; because it requires fresh Supplies to support it.

8. A *Show* of public Spirit, without an *Intention* of doing *Good*, will gain *Applause*; but *Reputation* gained requires some *Good* to be done.

9. Some degrade themselves, to put others upon *applauding* them; which, being seen through by the *Discerning*, renders these *Seekers* of *Applause* ridiculous.

10. Some praise others to their Faces, with a View of being repaid in the same Coin; but this *Cobweb* is so very thin, as rarely to catch *Flies* of any Magnitude,

11. A good Reputation is more necessary than ready Cash, for furnishing the useful Supplies of Life.

12. Reputation, lost by a *Misdemeanor*, or Oversight, is not easily, nor soon, recovered.

13. False Report, Backbiting, and Slander, are the capital Enemies of Reputation.

14. Invektives, *highly coloured*, seldom fail of Effect ; but low Scandal and immoral Abuse can do no Harm.

15. It was *Machiavel's* Maxim, that, in throwing Plenty of Dirt, some of it will stick ; but this Dirt must be of an *adbesive* Composition.

16. The strongest and most violent Reproaches are the least injurious ; because, as they generally proceed from Envy, Hatred, and Malice, they will not gain Credit with Men of Reputation and Judgement.

17. The faint Accuser is a more dangerous Enemy than the bold Assertor of bare-faced Lies and Scandal. The former, whilst he mixes Commendation with his Libels and Invektives, and pretends to be your Friend, (as if he inveighed against the Vice, and not the Person,) stabs you to the Heart ! The Presbyterian and Quaker Stabbers backbite you to your Face !

Rage if you bide, and Prejudice lay down,

A Satyr's Smile is sharper than a Frown. Buckingham.

18. The Savages in the Desert lie in Wait for your Lives, to satisfy their Hunger ; but the savage Backbiters prey on your Reputation, to satisfy their rancorous Spleen and Envy.

19. Little Defamers and Backbiters degrade others, to magnify and exalt themselves.

20. Men of Eminence are daily degraded by Persons of no Reputation.

21. Fame exceeds a common Reputation as much as our whole planetary System exceeds the Spot inhabited by a single Defamer.

22. The false and pernicious Report of a Backbiter does Injury unperceived and unawares ; destroying some in the good Opinion of others, to whom they are even unknown.

23. The Blots of Defamation by Backbiters, when artfully managed, with a Shew of Probability, are difficult to wash out ; but palpable Falshoods asserted can make no Stain.

24. An Acknowledgement of a Slander, artificially spread abroad, is not always a Cure for an injured Reputation ; because the Acknowledgement seldom or never reaches all the Persons and Places where the Poison was first spread : Against which Poison the only Remedy is a public Antidote.

25. Fame differs exceedingly, in Extent, from Reputation.

26. Reputation is the Property of private Persons of middling Merit only.

27. Fame moves in a vast Circumference, and belongs to Men of exalted Talents and Acquisitions.

28. Fame, the Product of extraordinary Worth, or Merit, is confirmed to the Owner by the concurring Testimonies of Mankind, and of Persons yet unborn. It is augmented by revolving Time.

29. The Sphere of Reputation is commonly circumscribed within the Territories of a Man's Acquaintance.

30. Fame is boundless ; it reigns where the Owner of it never was, and perhaps never will be.

31. Fame differs from Reputation in Extent of Duration.

32. Reputation belongs to the Living only, expiring soon after the Owner's Death. It is gained by Men in their Life-Time, from their worthy Actions and Conduct in the Opinion of others.

33. Fame is not terminated with Life ; but is increased and propagated, after Death, through a Succession of Ages ; as is testified by Men of the first Rate Merit and Distinction.

Mr.

☞ *Mr. Emerson's little concealed and imperceptible Adversaries will be confuted by Time, and be forgot like buzzing Insects that live but for a short Season.*

To the PALLADIUM - AUTHOR, on his Mechanical and Universal RULE OF PROPORTION, at Pages 54, 55, Palladium 1771.

"SIR,

"It is with Pleasure I can say there is more new Matter contained in the above-mentioned two Pages than in all the Books of common Arithmetic I have seen for these 10 Years. I don't know that I have seen this Rule's Equal: The more I use it, the more Pleasure it gives me. Had I been the Author of that single Rule, it would have given me more real Pleasure than publishing all the Compilations of Arithmetic extant; which shews there is yet Room for Improvement of common Arithmetic. *This Rule* has rendered the most difficult Part of Arithmetic the most easy. In teaching it to my Scholars, I intend to make it go Hand-in-Hand with the common Method, by Way of Comparison, to shew the Difference.

"Cuttingham-School, near Hull,

W. HARDY."

"Jan. 5, 1771."

A Specimen of further Improvement in arithmetical Rules, for the Use of Schools.

To number any Number of Figures mechanically.

Divide the Figures from Right to Left into *Threes*, by a *Comma* and a *Period*, alternately, writing 1 over the Figure to the Left of the 1st Point, 2 over the Figure to the Left of the 2d Point, 3 over the Figure to the Left of the 3d Point, &c. till all the Figures next all the Points to the Left are over-written: Then number every 3 Figures to the Right of every *Comma* as Hundreds, (with Tens, Units) and every three Figures to the Left of every *Comma* as Thousands, (with Tens, Units,) of the Denomination under which they stand; denoted by 1, signifying Millions; 2, Billions; 3, Trillions; 4, Quadrillions; 5, Quintillions; 6, Sextillions; 7, Septillions; 8, Octillions; 9, Nonillions; 10, Decillions; &c. Thus.

5 th 4 th 3 th 2 th 1 th
223.456,789.876,543.212,345.678,987.654,321

In Periods of 6 Figures.

5. One hundred and twenty-three Quintillions;
4. Four hundred and fifty-six thousand, seven hundred and eighty nine Quadrillions;
3. Eight hundred and seventy-six thousand, five hundred and forty-three Trillions;
2. Two hundred and twelve thousand, three hundred and forty-five Billions;
1. Six hundred and seventy-eight thousand, nine hundred and eighty-seven Millions;
0. Six hundred and fifty-four thousand, three hundred and twenty one.

☞ It is found by Experience, that Youth, being once taught to number 3 Figures, as Hundreds, may number any Number of Figures whatsoever, by the above mechanical Rule; and being thus at once qualified in common Numeration, they may proceed through Addition, by first getting by Heart an Addition-Table for the Purpose; and through common Subtraction, by taking each lower Number from 10, and adding the upper to the Remainder, when the lower Number cannot be taken from the upper, carrying an Unit to the next, (instead of first adding 10 to the upper Number;) then through Multiplication, by having first learnt the Multiplication-Table by Heart; and so through Division; when, and not before, Addition and Subtraction, of different Denominations, are best taken in Hand, without any Pence-Table, (the old exploded Practice.) Pence-Tables might as properly be made for Avoirdupoise and Troy Weight, Weights and Measures, and for other different Denominations, as for Pence only: Whereas stopping by Points, at every inferior Denomination, to be carried to the next higher Denomination, and setting down the Residue, is a Method far more expeditious and easy, for qualifying the Learner than the old Method of engaging with compound Additions and Subtractions before Multipli-

Mr. John Ross, of Portsmouth, who is an expert Mathematician, has taught the Principles of this Method with Success, for many Years, and has put his Scholars very forward thereby, in a short Time: Who has published an useful arithmetical Work, entitled, *The INSTRUCTOR'S ASSISTANT*; being a Compendium of Arithmetic, practical and abstruse. — To be had of the Author, at Portsmouth, or of the Booksellers.

Our Correspondent, Mr. T. Sadler, of Whitechurch, Shropshire, informs us that he is about publishing, by Subscription, *A System of practical Arithmetic, vulgar and decimal*, on an entire new Plan: Likewise *The Muses Cabinet, or Delights for the Ladies*; with a second Part, entitled, *Arithmetical Recreations for the Ingenious*: Price 2s. As also, at the same Time, a Poem, entitled, *The Harvest-Field*: Price 6d. The Places of Subscription are mentioned in his printed Proposals and Advertisement.

Mr. Bourne's Plan of Surveying, by the Chain and Pen only, contradicts all general and established Methods, by improved Instruments and accurate angular Dimensions, (without which inaccessible Distances cannot be had,) and therefore will gain no Credit.

To sum any Kind of GEOMETRICAL PROGRESSION, finite or infinite.

IN any geometrical Progression, where $a = 1^{\text{st}}$ Term, $r = \text{Ratio}$, $l = \text{last Term}$, $n = \text{Number of Terms}$, $s = \text{Sum of Terms}$,

$$a, ar, ar^2, ar^3, ar^4, \&c. \text{ to } ar^{n-1} = l$$

Lemma 1. As $1 : r :: s - l : s - a$. Whence, $s - a = rs - rl$, and $s =$

$$\frac{a - rl}{1 - r} = \frac{a}{1 - r}, \text{ when } l = 0; \text{ summing an infinite decreasing Progression;}$$

but the former Expression sums a finite one, (increasing or decreasing,) when $l =$ given Number.

Lemma 2. As $1 : r^{n-1} :: a : l$. Whence, $l = ar^{n-1}$. Hence all Conditions of a geometrical Series are solved, when $n =$ a finite Number.

Let $a = 10$, $r = \frac{9}{10}$, $l = 0$, then $\frac{a}{1 - r} = \frac{10}{1 - \frac{9}{10}} = \frac{100}{1} = 100$ exactly, the Sum of an infinite decreasing geometrical Progression, required.

N. B. If the Series be inverted $a = 0$, $l = 10$, then $s = \frac{a - rl}{1 - r}$ becomes

$$\frac{rl - a}{r - 1} \text{ (by changing the Signs) where } r = \frac{10}{9}. \text{ Hence } \frac{10}{9} \times 10 \div \frac{10}{9} = 2$$

$$= \frac{100}{9} \div \frac{1}{9} = 100, \text{ the same as before; without the Trouble used by}$$

Mr. Jones, that ingenious Mathematician, in his *Synopsis Palmariorum*, p. 203.

PALLADIUM AUTHOR.

N. B. If our new, short, practical, and mechanical, Rules of Arithmetic, are approved, for the speedily and perfectly qualifying all Learners in the Arithmetic Art, the Public shall be supplied with a Short Latin Grammar, (encouraging the same by Subscription also to the same Place) for qualifying Youth in that Language in the easiest Manner and shortest Time possible. Price 1s. to be paid for when the Grammar is published.

* * Such Readers and Correspondents as are desirous of our New, short, practical, and mechanical Rules of Arithmetic, for qualifying Youth in the shortest Time possible at School, or under a private Tutor, are desired to send their Names and Subscriptions to Mr. Steel, Bookseller, on Little-Tower-Hill, Lane-

THE
BRITISH PALLADIUM:
OR,
Annual Miscellany

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For the YEAR 1773.
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By the AUTHOR of the *Improved ROYAL ASTRONOMER AND NAVIGATOR*.



As Heirs to Worth their Honours still encrease,
Through a long Lineage of distinguish'd Race:
Palladiums of their antient Title boast;
And the last Heir aspires to merit most.

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MDCCLXXIII. Price One Shilling.

THE BRITISH PALLADIUM, OR INTRODUCTION.

SIR,

To the PALLADIUM-AUTHOR.

IF you think the following *versified* Remarks on a *wonderful* Subject, annually published in a *wonderful* Book, by an *eminent* Author, and his Assistant Projectors and Operators, (without any Proofs given of its Utility,) will afford any Satisfaction to the Public, in opening the Eyes of the Blind and Mistaken, I beg you will introduce the *same* into your useful *Palladium*.

I am, with Regard to Truth, Sir,

Spithead,
July 25, 1772.

Your most obedient humble Servant,

A PRACTICAL SEA-OFFICER,

On Board the Trial; but formerly belonging to the Greenwich:

*Quale per incertam lunam sub luce maligna
Est iter in sybris. — Virg. Æn. VI. v. 270.*

The LONGITUDE. A SONG. With explanatory Notes.

Tune. *A Gobbler there was, &c.* By a SEA-OFFICER,

1. WHILE Duntborne so clearly the Problem* has solv'd,
The dark Mists of Error Pretenders involv'd;
Who distanc'd by Duntborne, they have the Plate lost;
Like Whiston and Ditton — on wrong Side the Post!
Down, down, Greenwich-hill, up and down.
2. Lunar Places *twelve* Hundred and twenty,† we're told,
As next to be publish'd — and then to be sold;
With Bradley's bright Tables,‡ Results to be seen;
But, proving the Distances, Nothing they mean.
3. As Harrison's Watch by the Stars has been try'd;
Which, for not going true, is by them set aside;
So the Longitude-Book|| by the Sun, Moon, and Stars,
Should be prov'd — that their Distances § prove not a Farce.
4. Our Longitude-Chief, fam'd for splitting a Hair,
Suspects his own Scheme,¶ yet rejects Watts and Chair;
Impartially, else, he'd by fair Trial shew,
That the Distances † publish'd are *seen* to be true.
5. Impos'd on the Buyer, his Longitude-Book
The Navy must guide, should the Guide have mistook;
But why should our Seamen be led by such Schemes,**
Before they're examin'd, — and pry for as Dreams?

* Clearing, at once, the Parallax and Refraction of the Moon's Distance from the Sun or Star. † See the Nautical Ephemeris, End of the Preface, 1773.

‡ A pretended Improvement, in MS, on Mayer's first Tables; though Dr. Bradley was only an able Observer, and never professed himself to be a Mathematician, like Mayer or his able Predecessor, Dr. Halley; who called him a Hair-splitter, for taking minute Observations than Instruments or Practice would allow, in Halley's Opinion. He is said to have been assisted in his Rules of Computation and Accounts of the Motion of Light, and the Earth in her Orbit, by Simpson, of Woolwich, his Neighbour.

§ The Nautical Ephemeris. ¶ Moon from the Sun, or Star, computed.

|| The lunar Scheme; approved by the Oxford and Cambridge Professors, never at Sea, since the Death of Science.

‡ Compared with those observed, reduced to the true, for the same Times, as printed.

** Who depend on the old Way of keeping a Ship's Reckoning at Sea. Though the new Method, by the Nautical Ephemeris, is used for a puzzling Amusement by Sea-Officers,

16. The *Longitude-Wages*, for *Trials* allow'd,
Should pay for *Things needful*, for that *End* bestow'd;
If Officers *Wages* to these be apply'd,
For a *Pilot* and *Watch* they may pay for beside.
17. A *Quadrant*, divided exact to a *Third*,*
For the *Longitude Scheme*, might be purchas'd of *B-rd*; ||
A *Sextant* and *Tube*, with a *Book* to explain;
That *Others* by *Longitude-Projects* may gain.
18. *Assistant-Computers*, suppose one, two, three, †
With their *Pensions* || bestow'd, for a *Longitude-Fee*;
Of the *Chief* and *Subordinates*, ‡ is one so wise,
Who can show that their *Numbers* agree with the *Skies*?
19. The *Nearness* of *Instruments* ne'er did appear —
Nor the *Truth* of observing — how wide or how near;
These *Cayses*, *Mayer's Tables*, large *Error* compound;
And *Practice* the *The'ry* will ever confound.
20. The *Cups* and the *Balls* for a *While* may surpris'd!
Till the *Conjurer's Art* is found out by our *Eyes*;
His *magical Wand* we no longer will own,
When his *Mask* is stripp'd off, and his *Magic* is blown.
21. *Sage Malley* § found out what a *Frenchman* ¶ improv'd,
And then *Witch-I* wedded what others had lov'd;
Dunborne, for *Bye-Blow*, exerted his *Skill*,
And conquer'd the *LADY*, and gain'd her good *Will*.
22. To several *Saucebearts* she now fell a *Prey*;
Some had her by *Land*, and some had her by *Sea*:
She with *Mayer*, *Bliss*, and *Bradley*, †, intrigu'd, and with *More*;
Some since *Witch-I* courted her, and some before.
23. To a dignify'd *BOARD*, for *Protection*, she fled,
And pass'd for a *Maid* — with a pure *Maidenhead*;
A little *Man* took her his *Fortune* to make,
Who is fond of her *Charms* for the dear *Profi's* Sake †
24. A *Dutchman*, a *Welchman*, with *Servants*** to boot,
Beguil'd her — to taste of the *Longitude-Fruit*;
And now her *Embraces* quite common are grown,
She's a *Cast-off*, and *Ch-at*, and a *Prostitute* known.

Sea-Officers. This Method was first practis'd, and then rejected, by the French, as insufficient; from whom the English copied it, (like other French Fashions,) that the Purchase of *Mayer's Tables*, for 3000*l.* (a Secret between him and Dr. Bradley,) might not be in vain. The French would not buy them. Mrs. Stevens's Medicine cost more, (viz. 10000*l.*) but came to Nothing.

* To split an imperceptible Hair, or Spider's Thread.

|| An accurate Instrument-Maker.

† If the separate Computers do not see each other's Cards, the Examiner, or Third, knows how the Game goes between them and the principal Projector.

|| Sixty Pounds a Year each, Salary.

‡ Mr. Mason gives a Reason for the extreme Differences of Right Ascensions of the Stars: Who carried abroad more Abilities than he left behind him; and brought more Home than he found at his Return.

§ A truly eminent and great Astronomer and Mathematician, and who has been distinguished from the mere Observators, or Star-gazers, since his Time.

¶ De la Caille, an eminent and able French Astronomer and Mathematician.

† It is no Detraction to distinguish between superior and inferior Artists, above and below. Such is the Difference between mere Observers and mathematical Astronomers, or between first-rate heavenly Guides, and cracked-brained Enthusiasts and Methodists.

** Assistant-Quacks.

THE BRITISH PALLADIUM, OR

A NEW GUIDE to the YEAR 1773.

P A R T I.

To find the Day of the Month from the Day of the Week, and Day of the Week from the Month-Day.

Against each Month of the Year, to the Right-hand, stand the Seven Week-Days, above which stand all the Month-Days in that Month, answering to each Week-Day.

Contrarily. Under any Month-Day stands the Week-Day against that Month, at the Angle of Meeting.

MONTH DAYS and WEEK DAYS.

MONTHS of the YEAR.			1	2	3	4	5	6	7
January.	October.		8	9	10	11	12	13	14
February.	March.	November.	15	16	17	18	19	20	21
April.	July.		22	23	24	25	26	27	28
May.			29	30	31				
June.			Fr	Sa	Su	Mo	Tu	We	Th
August.			Mo	Tu	We	Th	Fr	Sa	Su
September.	December.		Th	Fr	Sa	Su	Mo	Tu	We
			Sa	Su	Mo	Tu	We	Th	Fr
			Tu	We	Th	Fr	Sa	Su	Mo
			Su	Mo	Tu	We	Th	Fr	Sa
			We	Th	Fr	Sa	Su	Mo	Tu

For Construction of the above Table, see P. 2, Palladium, 1763.

EXAMPLE I. To find the Day of the Month answering to the second Saturday in April, 1773.

To the Right-hand of April you find Sa, or Saturday; directly above which, in the Columns among the Month-Days, stand 3, 10, 17, 24, (and 31, xcluded,) answering to all the Saturdays in April: Therefore the third Saturday is the 10th Day, required. So for other like Cases.

EXAMPLE II. To find the Day of the Week on which the 24th of June, or Midsummer-day, happens, 1773.

Under 24, the Month-Day, against June, at the Angle where the upper and side Columns meet, stands Th, or Thursday, required.

NOTE for 1773.

Moveable FEASTS.

SUN rites.

Dom. Let. N.S.	C	Feb. 7. Septuages.	Mths.	1st	11th	21st	Examples.
O. S. F		24. Ash-Wed.					
Golden Number 7		28. 1 Sund. Lent		h m	h m	h m	Against May
Paet (or D's Age at		Apr. 11. East. Sund.	Jan.	8 5	7 58	7 45	the Sun rises
Year's Beginning) 6		May 16. Rog. Sund.	Feb.	7 22	7 6	30	h m
un's Cycle 18		20. Ascension	Mar.	6 32	6 12	5 52	1st 4 35
Roman Indiction 6		30. Whitsunday	April	5 31	5 14	4 53	11th 4 20
ra Jul. Pe. Ja. 6486		June 6. Trin. Sund.	May	4 35	4 20	4	21st 4 4
Olympds Jul. 2549		Nov. 28. Advent Sun.	June	3 51	3 45	3 43	Dif. 15 ^m in
Found. Ro. Ap. 2526		Ember-Days.	July	3 46	3 54	4	24 Hours, &
Nabonassar Fe. 2520		Mar. 3, 5, 6.	Aug.	4 20	4 36	4 54	16 ^m less for
Hegira July 1152		Jun. 2, 4, 5.	Sep.	5 15	5 32	5 54	10Ds. or 11 ^m
reg. Era O.E. 191		Sep. 15, 17, 18.	Oct.	6 13	6 33	6 33	a Day nearly.
's completed at the		Dec. 15, 17, 18.	Nov.	7 12	7 30	7 45	N. B. Sun-
Iths, O.S. Olymp. 2			Dec.	7 58	8 6	8	rising sub.
rs more than by dela		*The Rest the same					from 12 ^h
ande*. See Axioms &		wh his Cor ⁿ of former					gives Sun-
ules, p. 351, R. Afr.		Acct's in Con. des Tems.					setting.

N. B. The complete Years of the several Eras end at the Month, then the cur-
of Years take Place; each for a Year following.

Astronomical

ANNUAL MISCELLANY, 1773.

Astronomical MOONS for Greenwich-Observatory, 1773.

Full Moon.			Last Quarter.			New Moon.			First Quarter.		
Mths.	d	h m	d	h m		d	h m		d	h m	
Jan.	8	9 26 A	—	15 10 9 A	—	22	9 18 A	—	30	7 54 A	
Feb.	7	11 9 M	—	14 6 7 M	—	21	0 34 A	Mar.	1	4 30 A	
Mar.	8	10 56 A	—	15 2 30 A	—	23	5 21 M	—	31	9 58 M	
Apr.	7	8 45 M	—	14 0 4 M	—	21	10 32 A	—	29	11 30 A	
May	6	5 2 M	—	13 11 29 A	—	21	2 44 A	—	29	9 25 M	
June	5	0 16 M	—	12 1 2 M	—	20	5 8 M	—	27	4 19 A	
July	4	7 36 M	—	11 4 41 A	—	19	5 46 A	—	26	9 37 A	
Aug.	2	4 20 A	—	9 22 7 A	—	18	5 12 M	—	25	2 29 M	
Sep.	1	3 42 M	—	9 4 21 A	—	16	3 50 A	—	23	8 23 M	
	30	6 9 A									
Oct.	30	11 25 A	—	8 10 23 A	—	16	2 0 A	—	22	4 43 A	
Nov.	29	6 11 M	—	7 3 10 A	—	14	11 58 A	—	21	4 32 A	
Dec.	29	1 1 M	—	7 5 47 M	—	13	10 4 A	—	20	8 12 A	

N. B. M stands for Morning and A for Afternoon.

Add to the Month-day for the Moon's Age.		New D.	Sun and Moon's Place at New Moon.		Sun enters Signs.	Sub. and add from and to D's Southing for her Rising & Setting.		To find the Tides at London.	
No.	d		°	0		D Place.	Arc * +	Rule. Add 2 ^h 30 ^m to Time of D's Southg (fr. the Table of her Southing) for Time of High Water required.	
Jan.	7	22	10	3	♈ 19	3 0	8 30	Ex. Mar. 20, 1773, D'southg, by Tab. followz 20 ^d 9 ^h 55 ^m	
Feb.	9	21	11	3	♉ 18	4 2	8 15	Add 2 30	
Mar.	7	23	0	3	♊ 20	5 1	7 15	H.W. 0 a 25	
Apr.	8	21	1	2	♋ 19	6 0	6 15	Add 5 10	
May	9	21	2	1	♌ 20	7 11	5 15		
June	10	20	2	29	♍ 21	8 10	4 15		
July	10	19	3	27	♎ 22	9 0	4 0		
Aug.	12	18	4	26	♏ 22	9 20	4 15		
Sep.	13	16	5	24	♐ 22	10 29	3 15		
Oct.	14	16	6	23	♑ 23	0 0	6 15		
Nov.	15	14	7	22	♒ 21	0 29	7 15		
Dec.	16	13	8	22	♓ 21	1 28	8 15		
Here the Day of N. D. and No. added for the following Month make up the Days in the present Month.			Ex. II. Sep. 22 Add No. 13			Reg. D Pl. Feb. 18. D's Age 274		L.W. 5 ^a 31 at Lond. Bridge.	
			Abate 29 Moon's Age 6			Bef. N. — 3 X 13 ^o 8 ¹ = — 1 ^a 9 ^o		N.B. Time of H. & L.W. at Lond. serves for Boats and Vessels bound down & up the R. or fr. ab. & below Bridge, to Lond. respecty Gen. Rule. Add the T. of H.W. at N. and Full D for any Place, accords to a Tide-Tab. to the Time of D's South- ing, that Day, for H.W. at that Place.	
Exam. May N. D. 21, & June 10, added = 31 Ds. in May, the present Month. N. D. No. 14 & Dec. 16 added = 30 Ds. in Nov.			When D Age is above 29 or 30 Ds. sub. 29 or 30, as 1. & 2d Col. (ag ^t Mth) are 29 or 30.			D's Pl. at 7 N. D. } D Pl. Feb. } 18, Noon } 9 24 A near Comput. only.			
			To find Sun's Place. Sub. or add Deg. for Ds. bef. or aft. Centers a Sn. for his Place. Required Sun's Place for Aug. 15, 1773. 18 Au. ☉'s Pl. 4 ^a 26 ^o — 3 Ds. & Degs. — 3 15 Au. ☉'s Pl. 4 23 at Noon.			To find D's Rising & Setting, Feb. 18, 1773. Dm. Pl. fr. ab. 9 ^a 24 ^o Arc* corref + 4 ^h 21 D's So. 18th D. 9m 25 D rises 18 ^d 5m 4 Sets . . . 2 a 46 N.B. Take the Arc + nearest or proport. to D's Place above.			
To find Moon's Age. Ex. I. June 13 Add No. 10 Moon's Age 23 [Days]									

*N. B. The Festival marked * is preceded by a Vigil or Fast. If any of the Feast-days fall on a Monday, the Vigil or Fast-day must be kept on the Saturday before, and not on the Sunday, which is the greatest of Festivals.*

The Days having this Mark, †, against them are Holidays observed at the Exchequer, Stamp-Office, Excise-Office, Custom-House, Bank, East-India, and South-sea House.

At the Custom-House there is no Holiday on Valentine, St. David, Shrove-Tuesday, Easter-Wednesday, St. Swithin, Lammas-day, Fire of London, or Holy-Rood,

†† The Offices are mentioned 'All but such and such,' after †, where no Holidays are kept, when they are kept in all the other Offices.

MEMORANDUMS for the YEAR.

JANUARY, XXXI DAYS.

- 1 Circumcision. †
- 2 Sunday after Christmas.
- 3 Sir Isaac Newton b. 1642. N.S.
- 4 Epiphany, or Twelfth-day. †
All but South-sea House.
- 5 Lucian.
- 6 Sunday after Epiphany.
- 7 Hilary Cam. Term begins.
- 8 Oxford Term begins.
- 9 Exchequer opens.
- 10 Sunday after Epiph. Old 12th-day.
- 11 Prisca. Q. Cha. Birth-day kept. †
Russians at Portsmouth, on Friday, 1771.
- 12 Fabian. 1 Return.
- 13 Agnes.
- 14 Vincent.
- 15 Hilary Term begins.
- 16 Sunday after Epiphany.
- 17 Conversion of St. Paul. †
- 18 4 Return.
- 19 K. Charles I. beheaded 1648-9.
O. S. 12 Minutes past One. †

FEBRUARY, XXVIII DAYS.

- 1 Purific. B. V. or Candlemas. †
- 2 Bishop Blaize. 3 Return.
- 3 Agatha.
- 4 Septuagesima Sunday.
- 5 4 Return.
- 6 Dies scholastica at Oxford.
- 7 Hilary Term ends.
- 8 Old Candlemas-day.
- 9 Sexagesima Sunday.
- 10 Valentine. † All but Stamp, Custom, and South-sea House.
- 11 Quinquagesima, or Shrove-Sund.
- 12 Shrove-Monday.
- 13 Shrove-Tuesday. †
All but the Custom-House.
- 14 St. Matthias. * †

Ash-Wed. 1st Day in Lent. †

- 25 Cambridge Commencement for B. A. Day after Ash-Wednes.
- 26 Sunday in Lent.
- 27 Hare-hunting goes out.

MARCH, XXXI DAYS.

- 1 St. David. Anniversary-Meeting of the Welch Society, who wear a Leek on this Day in Memory of a famous Victory gained over the Saxons. † All but the Stamp and Custom-H.
- 2 Chad. B.
- 3, 5, 6, Ember-days.
- 7 Sunday in Lent, Perpet. Mauriti.
- 8 Gregory Mart.
- 14 Sunday in Lent.
- 17 St. Patrick, Bishop of Ireland.
- 18 Edward, K. of the W. Saxons.
- 19 Joseph.
- 20 Cuthbert. Equal Day and Night.
- 21 Sunday in Lent, or Midlent-Su.
- 22 St. Benedict.
- 25 Annunciation of the V. Mary. *
LADY-DAY, 1st Quarter-D. †
Cambridge latter Act. Thursday after the 4th Sunday in Lent.
- 26 Sunday in Lent.
- 31 Russians at Portsmouth, on Friday, 1769.
Sir I. Newton died, 1727. N.S.
- 1 APRIL, XXX DAYS.
- 2 Fool's-Cap Day; Hatton-Harry, Exeter Jack, Leonard Libel, Mr OFagon, Greenovicensis, &c.
- 3 Cam. Term ends, Fr. bef. Palm-Su.
- 4 Richard, B. of Chichester.
Ca. & Oxf. T. end, Sat. b. Palm-S.
- 5 Palm-Sund. St. Ambrose.
- 6 Old Lady-day.
- 7 Maundy-Thursd.
- 8 Good-Friday. †

11 EASTER

- 11 **EASTER-SUNDAY.**
 12 Easter-Monday. †
 13 Easter-Tuesday. †
 14 Easter-Wed. † All but Custom-h.
 15 Sun and Clocks together.
 18 1 *Sund. after Easter. Low-Sund.*
 19 Alphege.
 21 Oxford and Camb. Terms begin
 Wednesday after Low-Sunday.
 23 St. George. †
 25 2 *Sunday after Easter. St. Mark. †*
 27 Victory of Culloden.
 28 Easter Term begins.
MAY, XXXI DAYS.
 1 St. Philip and St. James. †
 2 3 *Sunday after Easter.*
 3 Invention of the Cross.
 4 1 Return.
 6 St. John ante Port. Lat.
 9 4 *Sunday after Easter.*
 10 2 Return.
 Westminster Election, Day after
 4th Sun. after Easter.
 12 Old May-day.
 16 *Rogation-Sunday.*
 17 3 Ret. 17, 18, 19, Rogation-days.
 19 Dunstan. Q. Charlotte b. 1744.
 20 Ascension-day, or Holy Thurs. †
 All but the South-sea House.
 21 4 Return.
 22 Princess Elizabeth born 1770.
 23 *Sun. aft. Ascension, or 6 S. af. East.*
 24 Term ends.
 26 Augustine, 1st Abp. of Cant.
 No Night, but all Twilight.
 27 Venerable Bede.
 Oxf. Ter. ends, Th. bef. Whit-Su.
 29 King Charles II.'s Nativity and
 Rest. after 12 Yrs Exile.
 30 **WHIT-SUNDAY.**
 31 Whit-Monday. †
JUNE, XXX DAYS.
 1 Whit-Tuesday. † Nicomedes.
 2, 4, 5, Ember-days.
 Whit-Wednesday. † All but
 the Custom-house.
 4 King George III. born 1738. †
 5 Boniface.
 6 *Trinity-Sunday.*
 7 1 Return.
 9 Oxford Term begins.
 10 Princess Amelia b. 1711. † All
 but Excheq. and Custom-house.
 11 St. Barnabas. † Trin. Ter. begins.
 13 1 *Sunday after Trinity.*

- 14 2 Return.
 16 Sun and Clocks together.
 17 St. Alban.
 18 2 *Sunday after Trinity.*
 Transl. of Edw. K. W. Sweden.
 21 3 Return.
 22 Longest Day.
 24 St. John Baptist. † 2d
 Quarter-day.
 27 3 *Sun. after Trin.*
 28 4 Return.
 29 St. Peter and Paul. †
 30 Buck-hunting comes in & con-
 tinues till Holy-rood. Exeter &
 Wadhams Col. Elect. at Oxf.
JULY, XXXI DAYS.
 2 Visitation of the B. V. Mary.
 3 Dies Comitiotum.
 4 4 *Sunday after Trinity.*
 Translat. of St. Martin, Bishop.
 6 Cambridge Commencement for
 B. A. 1st Tuesday in July.
 7 Tho. à Becket, Church Tyrant.
 9 Cambridge Term ends.
 11 5 *Sunday after Trinity.*
 13 Oxford Act, 7 Days from Cam-
 bridge Commencement.
 15 St. Swithin. † All but Stamp
 Custom, and South-sea House.
 17 Oxford Term ends.
 18 6 *Sunday after Trinity.*
 20 Margaret, Virgin and Martyr.
 22 Mary Magdalen.
 Q. of Denmark born 1751. †
 24 Magdalen College Election.
 25 7 *Sun. after Trin. St. James *†*
 26 Ann, Mother of the B. V. Mary.
 27 Portsmouth-Dock fired at 4 in
 the Morn. 1770, by an Erostratus
 seeking his Reward; like Brit-
 tain, who received his, at Bristol,
 in May, 1772, after making di-
 ligent Search to find it.
 30 Dog-days begin. Canicula rises
 with the Sun.
AUGUST, XXXI DAYS.
 1 8 *Sun. after Trin. Lamentas-day. †*
 4 Crown-Point in America taken
 by General Amherst, 1759.
 6 Transfiguration.
 7 Name of Jesus.
 8 9 *Sunday after Trinity.*
 10 St. Laurence.
 12 Princess of Brunswic b. 1737. †
 All but Cant. and S. S. H.
 12 Prince

THE BRITISH PALLADIUM, OR

- 12 Prince of Wales born 1762. †
 15 10 *Sunday after Trinity*.
 Assumption.
 16 Bp. of Osnaburgh b. 1763.
 21 Athanasius. Pr. Wm b. 1765.
 22 11 *Sunday after Trinity*.
 24 St. Bartholomew. †
 28 St. Augustine.
 29 12 *Sunday after Trinity*.
 Beheading of St. John Baptist.
 30 Sun and Clocks together.

SEPTEMBER, XXX DAYS.

- 1 St. Giles.
 2 London burnt, 1666; O. S. †
 5 13 *Sunday after Trinity*.
 7 Eunuchus.
 8 Nativity of the B. V. Mary.
 9 Dog-days end. Canis Major rises
 with the Sun at 3 in the Morn.
 12 14 *Sunday after Trinity*.
 14 Holy-Cross Day. † All but Sta.
 Custom and South-sea House.
 15, 17, 18, Ember-days.
 17 Lambert B.
 18 City of Quebec surrendered to
 General Townshend, 1759.
 K. George I. and II. landed. †
 All but at the Custom-house.
 19 15 *Sunday after Trinity*.
 21 St. Matthew. †
 22 K. Geo. III. and Q. Charl. Cor.
 1761. † Equal Day and Night.
 26 16 *Sun. after Trin.* St. Cyprian.
 28 Sheriffs of London sworn.
 29 ST. MICHAEL, third Quarter-
 day. † Hare-hunting comes
 in and lasts till the End of Feb.
 Princess Charlotte b. 1766.
 30 St. Jerome.

OCTOBER, XXXI DAYS.

- 1 Remigius, Bishop of Rhemes.
 3 17 *Sunday after Trinity*.
 6 St. Faith.
 9 St. Dennis.
 10 18 *Sun. after Trin.*
 Old Michaelmas-day. Oxford
 and Cambridge Terms begin.
 13 Transl. of K. Edw. Confessor.
 17 19 *S. af. Trin.* Etheldred V.
 18 St. Luke. †
 19 St. Frideswide, a Festiv. at Court.
 24 20 *Sun. after Trin.*
 25 K. Geo. III. Access. †

- 26 St. Crispin. Geo. III. proclaimed,
 1760. † All but the Stamp;
 Excise, Custom and S. S. H.
 28 St. Simon and Jude. †
 31 21 *Sunday after Trinity*.
NOVEMBER, XXX DAYS.
 1 All Saints. †
 2 All Souls. † All but the Stamp,
 Custom and South-sea House.
 3 1 Return. All-Souls Col. Elect.
 4 K. William b. 1605, O. S.
 5 Gun-Powder Treason, 1605. †
 6 Mich. Ter. beg. Leonard [Libel].
 7 22 *S. a. Tr.* D. Cumberland b. 1745.
 8 Princess Augusta Sophia b. 1768.
 9 Ld. Mayor's-d. Lon. † All but Ex.
 11 St. Martin.
 12 2 Return.
 13 Britius, Bishop.
 14 23 *Sunday after Trinity*.
 15 Machutus.
 17 Hugh Bp Lincoln. Anniv. Q. Eliz.
 Procl. † All but Cust. & S. S. H.
 18 3 Return.
 20 Edmund, King and Martyr.
 21 24 *Sunday after Trinity*.
 22 Cecilia. Old Martinmas-day.
 23 St. Clement.
 25 St. Catherine. 4 Return.
 D. of Gloucester born 1743. †
 Baliol College Election Thurt-
 day before St. Andrew.
 28 *Advent Sunday*.
 29 Michaelmas Term ends.
 30 St. Andrew. †

DECEMBER, XXXI DAYS.

- 4 Barbary.
 5 2 *Sunday in Advent*.
 8 Conception of the B. V. M.
 12 3 *Sunday in Advent*.
 13 Lucy.
 15, 17, 18, Ember-days.
 16 O Sapientia. Camb. Term ends.
 17 Oxford Term ends.
 19 4 *Sunday in Advent*.
 21 St. Thomas. †
 22 Shortest Day.
 23 Sun and Clocks together.
 25 CHRISTMAS-DAY, 4th Quar-
 ter-Day. Fox-hunting comes
 in and lasts till Lady-day.
 26 1 *Sun. af. Christ.* St. Stephen. †
 27 St. John the Evangelist. †
 28 Holy Innocents.
 31 Silvester, Bishop of Rome.

A TABLE of the Moon's Southings, or Times when she passes the Meridian of Greenwich Observatory, for the Year 1773. For the Use of Seamen, in finding the Time of Tides, &c.

D.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
1	6 29	7 11	5 52	7 13	7 42	9 4	9 37	11 17	Morn	0 10	1 12	1 12
2	7 10	8 0	6 42	8 5	8 35	10 0	10 37	Morn	0 35	0 55	1 58	2 1
3	7 54	8 51	7 32	8 56	9 27	11 0	11 37	0 11	1 22	1 40	2 45	3
4	8 39	9 42	8 24	9 48	10 23	Morn	Morn	1 2	2 7	2 26	3 32	3 4
5	9 28	10 35	9 17	10 43	11 21	0 0	0 36	1 51	2 51	3 11	4 21	4 3
6	10 17	11 28	10 10	11 39	Morn	1 1	1 31	2 37	3 36	3 58	5 8	5 2
7	11 8	Morn	11 5	Morn	0 20	2 0	2 24	3 22	4 21	4 45	5 55	6
8	Morn	0 21	11 58	0 36	1 20	2 57	3 14	4 7	5 8	5 33	6 44	6 5
9	0 1	1 15	Morn	1 34	2 22	3 49	4 0	4 50	5 55	6 22	7 33	7 4
10	0 52	2 6	0 51	2 34	3 22	4 39	4 45	5 35	6 43	7 11	8 23	8 3
11	1 45	2 59	1 47	3 34	4 19	5 27	5 29	6 21	7 33	8 2	9 14	9 3
12	2 36	3 53	2 43	4 32	5 12	6 12	6 12	7 7	8 24	8 51	10 8	10 3
13	3 27	4 47	3 40	5 29	6 2	6 54	6 54	7 55	9 14	9 43	11 2	11 3
14	4 19	5 42	4 38	6 23	6 48	7 37	7 40	8 44	10 4	10 35	0 3	0 3
15	5 8	6 38	5 36	7 13	7 34	8 20	8 26	9 35	10 56	11 28	1 2	1 3
16	6 0	7 35	6 32	8 0	8 18	9 5	9 12	10 26	11 48	0 24	2 7	2 3
17	6 54	8 28	7 26	8 48	9 0	9 50	10 2	11 17	0 44	1 21	3 7	3 2
18	7 50	9 24	8 19	9 32	9 44	10 36	10 51	0 7	1 35	2 23	4 6	4 2
19	8 46	10 14	9 8	10 16	10 26	11 23	11 42	1 1	2 31	3 22	5 1	5 1
20	9 43	11 5	9 55	10 58	11 11	0 13	0 25	1 51	3 28	4 22	5 53	5 5
21	10 39	11 52	10 41	11 42	11 56	1 3	1 23	2 44	4 26	5 20	6 40	6 4
22	11 34	0 2 8	11 26	0 27	0 45	1 53	2 13	3 36	5 24	6 15	7 26	7 2
23	0 24	1 23	0 2 8	1 12	1 33	2 42	3 3	4 30	6 21	7 8	8 10	8 7
24	1 13	2 7	0 54	1 59	2 21	3 30	3 53	5 25	7 18	7 57	8 54	8 5
25	2 2	2 51	1 38	2 46	3 11	4 19	4 43	6 23	8 12	8 44	9 36	9 3
26	2 46	3 34	2 22	3 34	4 0	5 9	5 35	7 20	9 4	9 29	10 21	10 21
27	3 28	4 17	3 8	4 23	4 50	5 59	6 29	8 16	9 52	10 14	11 5	11 8
28	4 12	5 5	3 55	5 13	5 38	6 50	7 26	9 13	10 40	10 58	11 50	11 5
29	4 56		4 43	6 3	6 27	7 44	8 24	10 7	11 25	11 42	Morn	Morn
30	5 38		5 31	6 52	7 18	8 40	9 22	10 58	Morn	Morn	0 36	0 43
31	6 24		6 21		8 9		10 20	11 48		0 27		1 31

To find Time of H. Water, on any Day of the Month, at any given Place, for 1773.

Gen. Rule. To the Time of the Moon's Southings (fr. the above Tab.) for that Day, add the Time of H. W. at N. and F. Moon in the given Place (fr. Tide-Tab. p. 105, 106, Pal. 1765, or any other Tide-T.) and the Sum, abating 12, when above 12^h will be T. of H. W.

Example. To find the Time of High Water, at London, on April 1, 1773.

From the above Table, the Moon souths, at London, on that Day, 7^h 13^m Aft. To which add the constant Time of High Water at New and Full, Lond. 2 30

Time of High Water, May 1, at London, 9 43 A. req.
Add for next Low Water, 5 30

Low Water at London, April 1, 1773, 3 13 Morn.

N. B. Time of H. W. serves for Boats & Vessels bound to Places below Bridge, fr. Lond and Time of Low Water serves for Boats & Vessels bound to Places above Bridge, fr. Lond.

* * * Seamen may determine the Time of H. & L. W. at all Places by the foregoing Gen. Rule, fr. the above Tab. and the constant Time of H. W. at N. & F. Moon, at each Place, fr. a Tide-Table. The above Table is also of Use for finding the Moon's near Time of Rising and Setting, from her mean Place, and Semi-duration Arc for any Place.

TABLE of the Eclipses of the first SATELLITE of JUPITER, for Gr. Obs. 1773.
For finding the Difference of Longitude, by Sea or Land.

January.	February.	March.	April.	May.	June.
Immerf.	Immerf.	Immerf.	Immerf.	Immerf.	Immerf.
If this Mth being so near ☉, the Eclip. of his Sat. can not be seen. The*is plac'd against the visible Eclipses of the first Sat. of ♃ for Greenwich. N.B. When the Time at the Ship is later than that at Greenwich, the Longitude is East; if sooner, West of Greenw.	Jupiter's Satellites are invisible this Month also, by being too near the Sun to be seen. Jupiter's Satellites are also invisible in March, by being too near the Sun to be seen.	Though it may be seen that the D's Passage over the Meridian and the Times of these Eclipses in the Naut. Ephem. agree so near with those in the Con. des Tems, reduced to the Merid. of Greenwich, that the former appear to be adjusted by the latter.	D. h m s 1 4 58 39 2 23 27 47 3 17 56 59 4 12 26 7 5 6 55 18 6 1 24 22 7 19 53 31 8 14 22 32 9 8 51 36 10 3 20 36 11 21 49 35 12 16 18 32 13 10 47 31 14 5 16 25 15 23 45 11 16 18 14 7 17 12 42 54	D. h m s 1 7 11 37 2 1 40 26 3 20 9 5 4 14 37 43 5 9 6 25 6 3 34 57 7 12 3 35 8 16 32 8 9 11 0 36 10 5 29 4 11 23 57 27 12 18 25 49 13 12 54 12 14 7 22 34 15 1 50 50 16 20 19 5 17 14 47 15 18 9 15 31	D. h m s 1 3 43 45 2 22 11 51 3 16 39 59 4 11 8 7 5 5 36 13 6 0 4 20 7 18 32 22 8 13 0 23 9 7 28 28 10 1 56 30 11 20 24 28 12 14 52 33 13 9 20 36 14 3 48 37 15 22 16 41 16 16 44 50 17 11 12 47

July.	August.	Septemb.	October.	Novemb.	Decemb.
Immerf.	Immerf.	Immerf.	Emerfions	Emerfions	Emerfions
D. h m s 2 5 40 54 3 0 9 4 4 18 37 11 5 13 5 18 6 7 33 31 7 2 1 40 8 20 29 49 9 14 58 3 10 9 26 12 11 3 54 35 12 22 22 53 13 16 51 15 14 11 19 37 15 5 47 57 16 0 16 25 17 18 44 55 18 13 13 24	D. h m s 1 7 51 59 2 2 10 33 3 20 39 10 4 15 7 46 5 9 36 30 6 4 5 6 7 22 33 53 8 17 2 38 9 11 31 24 10 6 0 17 11 0 29 7 12 18 57 57 13 13 26 52 14 7 55 53 15 2 24 53 16 20 53 54 17 15 22 57 18 9 52 4	D. h m s 2 4 21 8 3 22 50 13 4 17 19 21 5 11 48 25 6 6 17 41 7 0 46 43 8 19 16 4 9 13 45 13 10 8 14 30 11 2 43 41 12 12 55 20 13 15 42 9 14 10 11 26 15 4 40 83 16 20 55 17 1 20 55 18 19 50 12 19 14 19 20	D. h m s 2 8 48 33 3 3 17 44 4 21 46 57 5 16 16 12 6 10 45 23 7 5 14 31 8 23 43 37 9 18 12 47 10 12 41 49 11 7 10 57 12 1 40 4 13 8 57 14 20 8 57 15 9 6 59 16 3 35 56 17 23 4 50 18 16 33 42	D. h m s 1 11 2 34 2 5 31 26 3 0 0 7 4 18 28 56 5 12 57 40 6 7 26 22 7 1 54 53 8 20 23 36 9 14 52 9 10 9 20 40 11 3 49 2 12 22 17 28 13 16 45 56 14 11 14 11 15 5 42 33 16 0 10 57 17 18 39 13 18 15 5 34	D. h m s 1 13 7 29 2 7 35 42 3 2 3 53 4 20 32 4 5 15 0 14 6 9 28 23 7 3 56 26 8 22 24 36 9 16 52 41 10 11 20 45 11 5 48 47 12 0 16 58 13 18 45 4 14 13 13 4 15 7 41 9 16 2 9 17 17 20 37 26 18 15 5 34

To find the Difference of Longitude from Greenwich Observatory.

Rule. The Difference of Time between any Eclipse of Jupiter's first Satellite, at Greenwich, happening as above, and the Time the same Eclipse is observed to happen under a distant Meridian, being turned into Degrees, at Sea or Land, will be the Difference of Longitude between Greenwich and the Place of Observation.

Example, Eclipse of 1st Satellite of Jupiter at Greenwich, May 14 7^h 11^m 37^s. The same Eclipse being observed at Sea, or a distant Port, later, 1 16 23 58

Hence, Diff. Lon. to the East of Greenw. is 138° 5' 15", req. Diff. later, 9 12 21

Two ECLIPSES of the SUN, and Two of the MOON, for 1773.

I. Of the SUN: Invisible in England. March 23^d. Morning.

Conjunction $5^h 21^m 42^s$, and Moon's Latitude N. $42' 34''$. This Eclipse is central and annular in Part of Chinese Tartary, or 116° East Longitude, from Ferro, and 38° North Latitude. Sun rises at Paris $5^h 53^m$ Morn. Eclipsed at $4^h 45''$. Eclipse ends at Paris $6^h 3^m 30^s$ Morn.

By the *Nautical Ephemeris* the Conjunction is at $5^h 21^m$, in $2^\circ 54\frac{1}{2}'$ of φ ; Moon's Latitude $42\frac{1}{2}'$ North. Said to be visible in the Eastern Parts of Europe and several Parts of Asia, (but not at Paris,) by Mr. Maskelyne and his Assistants for executing the Office of Astronomer Royal.

II. Of the MOON: Invisible in England. April 7^d Morning; but visible in America. Opposition at $8^h 46^m 28^s$ Morning. Moon's Latitude N. $39' 55''$.

Beginning $7^h 18^m 40^s$	} <i>Greenwich</i>	} <i>By Naut. Eph.</i>	} $7^h 18^m$		
Middle $8 \quad 40 \quad 52$				} according to	} $8 \quad 40\frac{1}{2}$
End $10 \quad 3 \quad 5$					
Digits eclipsed $8^d 18' 30''$ S.		<i>Numbers.</i>	Digits $8^\circ 19'$ with <i>Allowance.</i>		

Quere, How these Times agree so near, and the Times of Lunations are so far off, those in the *Connoissance des Temps*.

III. Of the SUN: Invisible. September 16. Conjunction, at $3^h 49^m 32^s$, Afternoon, with $39' 47''$, South Latitude. This Eclipse is central and total at Noon, a little to the East of Magellan, or about Falkland-Island, in 320° Longitude from Ferro, Easterly, and 37° South Latitude.

By the *Nautical Ephemeris*. Conjunction, $3^h 49^m$, in $24^\circ 1' 17''$. Moon's Latitude S. $41\frac{1}{2}'$ (with Allowance) at $4^h 20^m \frac{1}{2}$, will be centrally eclipsed on the Meridian in Latitude 45° S.

IV. Of the MOON: Partly visible in England, September 30, Opposition $6^h 9^m 27^s$, Afternoon, with S. Latitude $34' 37''$.

Beginning $4^h 31^m 45^s$	} <i>At Greenwich.</i>	} <i>By the Naut. Eph.</i>	} Beginning $4^h 31^m \frac{1}{2}$	
Middle $6 \quad 2 \quad 11$				} Moon rises $5 \quad 54$
End $7 \quad 32 \quad 37$				
Digits $8^d 12'$ on the North Part.			End $7 \quad 33\frac{1}{2}$	
			Digits $8^d 17'$	

N. B. The Beginning, Middle, and End, (in the above Calculation, from the *Naut. Eph.*) evidently agree with the Numbers by M. De la Lande; though the Lunations in the *Nautical Ephemeris* and *Connoissance des Temps* so widely differ.

* * * This Year Saturn's Ring will disappear. His Face is observed round. Jupiter nearest to the Sun and Earth. His Belts are so visible, that his Rotation may be easily observed.

ADVERTISEMENT.

Our Correspondents, in general, are desired to send all their Letters and Productions before the End of May (franked or Post paid); the sooner they send the more they can be obliged; directed to the Palladium-Author, at Mr. Cole's, Mathematical Instrument Maker, Fleet-street, London.

A COMPARISON of some Lunations, according to the British Nautical Ephemeris, (*vulgarly called the Nautical Almanac, from De la Caille's former French Title and Plan,*) conducted by Mr. Maskelyne, and the French Connoissance des Temps, (*reduced to the Meridian of Greenwich,*) conducted by Mr. De la Lande.

	d	h	m		
June 20	5	8	M.	Nautical Ephem.	} New Moon.
19	6	36	M.	Con. des Temps.	} Dif. + 10 h. 32 m. Naut.
July 4	7	37	M.	Nautical Ephem.	} Full Moon.
5	0	20	M.	Con. des Temps.	} Dif. — 16 h. 43 m. Naut.
11	4	43	A.	Nautical Ephem.	} Last Quarter.
11	4	51	A.	Con. des Temps.	} Dif. — 8 m. Naut.
Sept. 1	3	41	M.	Nautical Ephem.	} Full Moon.
1	3	55	M.	Con. des Temps.	} Dif. — 14 m. Naut.
16	3	49	A.	Nautical Ephem.	} New Moon.
15	3	49	A.	Con. des Temps.	} Dif. + 1 d. Naut.
23	8	22	M.	Nautical Ephem.	} First Quarter.
23	6	41	M.	Con. des Temps.	} Dif. + 1 h. 41 m. Naut.
Oct. 22	4	41	A.	Nautical Ephem.	} First Quarter.
22	4	50	A.	Con. des Temps.	} Dif. + 9 m. Naut.
Nov. 21	4	31	M.	Nautical Ephem.	} First Quarter.
21	4	45	M.	Con. des Temps.	} Dif. — 14 m. Naut.

Query the Cause of so great a Difference.

N. B. The nearest Numbers to Truth may be discovered by a careful Computation from the lunar Tables and Equations in the improved Royal Astronomer; or from the Durham Tables; or, more readily, by a general Comparison with other annual Computations.

Correction. P. 3. L. 23. [a] omitted. Read
Dunthorne for a Bye-Blow exerted his Skill.

NUMBER II.

ALPHABETICAL CHRONICLE of REMARKABLE EVENTS.

According to Authorities.

N. B. *b* stands for before, and *s* since, Christ; or a Date without any Mark before it denotes since Christ.

A. <i>Bef. & since Chr.</i>	<i>America, South, first discovered by Chr. Columbus (a Genoese)</i>	<i>Antony, Marc, killed himself</i>
<i>Aaron</i> born 1575, died <i>b. 1453</i>	<i>s 1493</i>	<i>b 30</i>
<i>Abel</i> born, 3 of the World, killed by Cain 129 ditto.	<i>Anaxagoras</i> died, aged 70 <i>b 428</i>	<i>Apelles, the Painter, lived in the Time of Alexander the Great</i> <i>b 340</i>
<i>Aesop</i> died <i>b 556</i>	<i>Anaximander, who invented the Signs of the Zodiac, died, aged 64</i> <i>b 64.</i>	<i>Apollonius, the Geometrician, lived</i> <i>b 242</i>
<i>Ajax, Son of Teucer, flourished</i> <i>b 1154</i>	<i>Angelo, Michael, Painter; died, aged 89</i> <i>s 1564</i>	<i>Archilochus, Inventor of Iambic Verse, lived</i> <i>b 686</i>
<i>Ambrosius, Aurelius, chosen King of the Britons, and crowned at Stonehenge</i> <i>s 465</i>	<i>Annibal, (or Hannibal,) Carthaginian General, died</i> <i>b 260</i>	<i>Argos, Kingdom of, began under Inachus, 1080 Years before the first Olympiad, or</i> <i>b 1856</i>
<i>America, North, first discovered by J. Cabot, a Venetian (first settled in James the First's Reign)</i> <i>s 1498</i>	<i>Antisthenes, Philosopher, lived</i> <i>b 395</i>	<i>Argyle, Marquis of, beheaded in Scotland, May 27</i> <i>s 1661</i>
		<i>Argyle,</i>

- Argyle*, Earl of, executed at Edinburgh s 1685
Arifarchus, Astronomer, died, aged 81 b 81
Aristides, Greek Orator, lived b 120
Aristophanes died, aged 80 b 200
Armada, of Spain, arrived in the English Channel, July 19, dispersed by a Storm s 1588
Affyria, Kingdom of, began under Ninus b 2084
— lasted about 1264 Years, ending with Sardanapalus.
— Out of its Ruins were formed the Assyrians of Babylon, of Nineveh, and the Kingdom of Medes.
Atbanasius, St. died, aged 73 s 373
Atbens taken by Xerxes b 480
Augustin, St. Father of the Latin Church, born 354, died s 431
Augustin, St. sent by Pope Gregory to convert the Britons, landed in the Isle of Thanet s 597
— was soon after made Archbishop of Canterbury, died s 604
Ausonius died s 392 B.
Babel, Tower of, began to be built b 2247
— continued building 40 Years, when God confounded their Language and dispersed them into different Nations. Thence arose the Difference of Language, the Dispersion of the People, and Formation of Empires. From Japhet, the eldest Son of Noah, sprang the Inhabitants of the North of Europe and Asia, and those of the West.
From Shem came the People of the East, as also those of Israel; and from Ham descended the Canaanites, Philistines, Egyptians, and antient Possessors of Africa.
Babylon, Kingdom of, founded by Nimrod b 2640
Bajazet defeated by Tamerlane, 1402, died s 1403
Baker, Sir Richard, Author of the Chronicle, born 1584, died s 1645
Balsazzar saw the Hand-writing on the Wall b 538
Bank of England established s 1693
Baronets 1st created s 1611
Barrow, Rev. Dr. Isaac, died, aged 47 s 1677
Bath, Order of the, instituted at the Coronation of Henry IV. re-established s 1725
Battle, fought by Marinus, who made a great Slaughter of the Teutones and Ambrones, near Aix in France, 200,000 of them being left dead in the Field, and 80,000 taken Prisoners b 102
— 70,000 of the Saracens slain in Battle by Ramirus, King of Spain s 844
— July 29, Basilus, Emperor of the East, defeated the Bulgarians, made 15,000 of them Prisoners, whose Eyes he caused to be put out, except one Man in a Hundred, to whom he left one Eye to serve as Leaders to the Rest 1014
— of Ashdown, between Canute & Edmund 1016
Battle of Hastings, where King Harold was killed, Oct. 14 1066
— Bovines, Jul. 25 1214
— Lincoln, May 19 1217
— Lewes, May 14 1264
— Evesham, Aug. 4 1265
— Bannockburn, June 25 1314
— Halidon-hill, near Berwick, where 30000 Scotch were slain, and only 15 English, July 19 1333
— Cressy, Aug. 26 1346
— Durham, when David King of Scots was taken Prisoner, Oct. 17 1346
— Poitiers, when the King of France and his Son were taken Prisoners, Sep. 19 1356
— Otterburne, between Hotspur and the Earl of Douglas, July 31 1388
— Shrewsbury, July 12, 1403
— Agincourt, Oct. 25 1415
— Beaugé, where the Duke of Clarence was killed, April 3 1421
— Crevant, June, 1423
— Verneuil, Au. 27 1424
— Herrings, Fe. 12 1429
— St. Albans, May 22 1455
— Bloreheath, Sept. 23 1459
— Northampton, Jul. 10 1460
— Wakefield, De. 24 1460
— Tooton, Mar. 29 1461
— Hexham, May 15 1464
— Banbury, Jul. 26 1469
— Stamford, March 1470
— Barnet, Apr. 14 1471
— Tewksbury, May 4, 1471
— Bosworth, Au. 22 1485
— Stoke, June 6 1487
— Blackheath, June 22 1497
Battle

- Battle of Floudon*, when James IV. K. of Scots, was killed, Se. 9 1513
 — *Solway*, Nov. 24 1542
 — *Pinkey*, Sep. 10 1547
 — *St. Quatin*, Aug. 10 1557
 — *Edgehill*, Oct. 23 1642
 — *Shatton*, May. 16 1643
 — *Lausdown*, Jun. 5 1643
 — *Roundaway-down*, July 13 1643
 — *Newbury*, Se. 20 1643
 — *Marston-Moor*, July 2 1644
 — *Newbury*, Oc. 27 1644
 — *Naseby*, June 1645
 — *Dunbar*, Sep. 3 1650
 — *Worcester*, Sep. 3 1651
 — *Bothwell-Bridge*, June 22 1679
 — *the Boyne*, Jul. 1 1690
 — *Aughrim*, Jul. 22 1691
 — *Blenheim*, Au 2 1704
 — *Ramilies*, Whitsunday 1706
 — *Oudenard*, June 30 1708
 — *Malplaquet*, Sept. 11 1709
 — *Dumblain*, No. 12 1715
 — *Dettingen*, June 26 1743
 — *Fontenoy*, April 30 1744
 — *Preston-Pans*, Sep. 21 1745
 — *Falkirk*, Ja. 17 1746
 — *Culloden*, Ap. 16 1746
 — *Rosbach*, Nov. 5 1757
 — *Minden*, Aug. 1 1759
Bede, Venerable, aged 53, died 735
Behn, Mrs. died 1689
Bentley, (Ego sum Bentleyus), Rev. Dr. Rich. born 1662, died 1742
Berkeley, Bishop of Cloyne (who raised the Ghosts of departed Quantities) died, aged 73 1753
Bible, Translation of it first allowed 1539
Bigamy, Statute of, first passed 1277
Bishops, 7, burnt 1555
Blackmore, Sir Richard, died old 1729
Blake, Admiral, born 1598, died 1657
Blood seized the Duke of Ormond with an Intent to hang him at Tyburn, but was prevented, Dec. 6 1670
 — attempted to steal the Crown out of the Tower, May 9 1671
Boadicea burnt London, and massacred 70,000 Inhabitants; soon after, being defeated by Suetonius, poisoned herself 59
Borgia, Cæsar, killed himself, Mar. 12 1508
Boyer, the Lexicographer, born 1664, died 1729
Brabe, Tycho, born 1546, died 1601
Bread, first Assize of, made 1202
Britain first discovered to be an Island 90
Britons applied to Rome for Aid against the Scots, and refused, 446, invited over the Saxons 448
Buckingham, Duke of, assassinated at Portsmouth by Fenton, aged 35, Au. 23 1628
Burnet, Bishop of Sarum, born 1643, died 1715
Busby, Rev. Dr. Richard, born 1606, died 1695
Butler, Samuel, the Poet, born 1612, died 1680
Byng, Admiral, shot at Spithead, March 14 1757
 C.
Calais taken by the English, Aug. 4 1347
 — retaken by the French, December 1557
Cambridge University, founded 915. Burns by the Danes 1010
Camden, the Historian, born 1551, died Nov. 9 1623
Canute, first Danish King of England, invaded England 1015; was chosen King by the Clergy, at Southampton, 1016; began to reign alone 1017; made Alliance with Normandy, and married Emma, Ethelred's Widow, 1018; made a Voyage to Denmark, attacked Norway, and took Possession of the Crown, 1028; died at Shaftesbury. in England, 1036; was buried at Winchester, and succeeded by his Son Harold.
Cardinal, the Title of, first used about the 9th Century.
Caroline, Queen to George II. died of a Mortification in the Bowels, aged 54, Nov. 20 1737
Cato killed himself, aged 48, Feb. 5 b 45
Catullus, born at Verona, 87, died b 11
Centlivre, Mrs. Susan, died Dec. 1 1723
Cervantes, Mich. de, born at Madrid 1549, died 1616
Chambers, Ephraim, Writer of the Dictionary of Arts, died 1740
Charter-house founded by Tho. Sutton, Esq. 1611
Cbaucer born, 1328, died 1400
Christianity supposed to be established in Britain 60
Churches first began to be built 696
Cicero born, b 107; made an Oration against Verres, 70; made his second Oration against the

- the Agrarian Law, 65;
banished Rome, April,
58, died *b* 43
- Clarke*, Rev. Dr. Samuel,
born 1675, died 1729
- Claudius Cæsar* landed in
Britain, August 43
- Cleopatra*, Queen of E-
gypt, killed herself,
aged 50 *b* 20
- Coaches* first used in Eng-
land 1155
- Coaches*, Hackney, Act
for licensing them pas-
sed 1693
- Codrus*, the last Athenian
King, voluntarily gave
his Life for the Good
of his Country, after
he had reigned 21
Years *b* 1095
- Coke*, Lord Chief Justice,
born 1549, died 1654
- Colet*, Dr. John, Founder
of St. Paul's School,
born 1466, died 1519
- Colossus* of Rhodes thrown
down by an Earth-
quake *b* 224
- Comets* appeared in 1104,
1107, 1110, 1256,
1315, 1371, 1401,
1577, 1618, 1647,
1652, 1661, 1664,
1665, 1666, 1667,
two in 1680, &c.
- Confucius*, the Chinese
Philosopher, born *b* 551
- Congreve*, William, born
1672, died 1729
- Constantinople* founded by
the Argives, *b* 658, ta-
ken by the Turks
b 1453
- Copernicus*, Astronomer,
of Thorn in Prussia,
died, aged 60 1543
- Cornelius Nepos*, an Au-
thor, died about *b* 25
- Coventry* Act passed 1669
- Cowley*, Abraham, the
Poet, born 1618, died
1667
- Cranmer*, Abp of Canterb.
burnt, Mar. 21 1556
- Cromwell*, Oliver, born
April 25, 1599, at
Huntingdon; made Co-
lonel 1643; went over
to Ireland with his Ar-
my, July 1649; re-
turned, May 1650;
made Protector, for
Life, Dec. 12, 1653;
was near being killed
by falling from a
Coach-box, October
1654; elected King,
but refused the Title,
May 8, 1657; died,
at Whitehall, of the
Gout in his Stomach,
Sept. 3, 1658; lea-
ving his Son Richard
his Successor.
- Cromwell*, Richard, pro-
claimed Protector, Sep.
3, 1658; deposed Ap-
ril 22, 1659; died,
aged 89, Jul. 12 1712
- Curtius*, Quintus, lived
b 64
- Cyprian*, St. martyred 258
- Cyrus* took Babylon, after
a long Siege, *b* 544,
died *b* 529
- D.
- Darnley*, Lord, married
Mary of Scots, 1561;
murdered, by being
blown up, Fe. 10 1567
- David* succeeded Saul on
the Throne of Israel,
b 1055; committed
Adultery with Bath-
sheba, *b* 1035; mar-
ried her, *b* 1033; died,
aged 70 *b* 1015
- Death*, Capt killed in an
Engagement with a
French Ship, Dec. 23
1757
- Delpas*, Temple of, built
b 548
- Deluge*, general, threaten-
ed in the Year 1536;
began Nov. 25, in the
Year of the World
1656, that is, *b* 2348.
It continued a whole
- Year, Noah being a-
bout 600 Years old.
The 17th of the se-
venth Month the Ark
rested upon Mount A-
rarat; the 1st of the
10th Month the Tops
of the Mountains ap-
peared; 27th of the
2d Month, *b* 2347,
Noah left the Ark,
on Friday, December
18, having been in it
377 Days.
- Deluge* of Deucalion in
Thessaly *b* 1529
- Democritus*, Philosopher,
died, aged 109 about
b 403
- Demosthenes*, a Greek O-
rator, called from Ba-
nishment, *b* 322. Poi-
soned himself, aged 62
b 313
- Des Cartes*, French Phi-
losopher, born in Tou-
raine, 1596, died 1650
- Diana*, famous Temple
of, at Ephesus, burnt
by Erostratus, to record
himself *b* 356
- Diodorus Siculus* lived *b* 45
- Diogenes*, the Cynic, died
b 324
- Doctor*, the Degree of,
first given in Eng. 1207
- Doomsday-book* (of valu-
ing English Land) fi-
nished after 6 Years
Labour 1085
- Drake*, Sir Francis, set
Sail on his Voyage
round the World 1577,
died in England, aged
50, Jan. 28 1595
- Dryden*, John, a great
Poet, born 1631, died
May 1 1700
- Duck*, Rev. Stephen, (un-
worthy of the Bounties
bestowed on him)
drowned himself like a
Goose 1756
- Buelling* introduced into
England 1587
- Dunkirk*

- Dunkirk* taken by the English, Jun. 24, 1658; sold to the French for 500,000 *l.* Octob. 17 1662
- Dionysius*, the elder Tyrant of Syracuse, died *b* 368
- Dionysius Halicarnassensis* lived *b* 30
- E.
- Earthquake* swallowed up several Villages in the Neighbourhood of Cybura *s* 417
- swallowed several Cities in Palestine *s* 419
- at Antioch swallowed up 4800 Inhabitants *s* 428
- almost entirely threw down the City of Antioch, Sept. 14, at Night *s* 458
- at Constantinople, which lasted 40 Days, and overturned several stately Buildings *s* 480
- destroyed Antioch and several other Cities *s* 526
- at Constantinople that lasted 40 Days *s* 553
- a great one at Rome and Constantinople, which overthrew many Houses *s* 557
- A great one in England, Dec. 1116
- in September 1120
- King Henry surprised by a terrible one, when he was about to take Ship and sail for Normandy from England, the Flames breaking out of certain Rifts of the Earth with great Violence, Aug. 2 1134
- The City of Catania and upwards of 15000 Souls swallowed up by one 1173
- A great one in England that overturned the Church of Lincoln and other Churches 1185
- A dreadful one, Feb. 4 1248
- Several Steeples and Houses thrown down in Somersetshire by one 1249
- A general one in England, that threw down St. Michael's Church on the Hill, without Glastonbury, in England 1247
- The greatest one ever known in England, Nov. 14 1318
- Several Churches thrown down by one in England, May 21 1382
- a dreadful one, accompanied with Thunder and Lightning: Sept. 28 1426
- Two Shocks of one in London, Jan. 8 and Feb. 8 1750
- One laid all Lisbon in Ruins, Nov. 1 1755
- Egypt*, Kingdom of, began under Misriam, the Son of Ham, the 2d Son of Noah, *b* 2188 and lasted 1663 Years.
- Empedocles* flourished *b* 455
- Epictetus*, alive *s* 94
- Epicurus* born *b* 342, died *b* 271
- Episcopacy* abolished in Scotland *s* 1638
- Erasmus*, born at Rotterdam, 1467, died 1536
- Euclid* died, aged 74, about *b* 241
- Eugene*, Prince, died, aged 72, Apr. 10 1736
- Euripides* died, aged 77 *b* 407
- Exchange*, Royal, first finished at the Expence of Sir Thomas Gresham, 1569; called Royal by Queen Elizabeth,
- Jan. 29, 1571; rebuilt, finished, and opened, (for mercantile Traffic), Sep. 28 1669
- Excbequer*, Court of, instituted 1074
- Excise-Office* formed 1643
- F.
- Famine*, Beginning of that which lasted 7 Years, *b* 1708. An extraordinary one at Rome, when many Persons threw themselves into the Tyber, *b* 440. So dreadful an one in Italy, that Parents were put to the cruel Necessity of eating their own Children, *s* 450. One in 976; another, 1005; another, 1087; another, 1193; another, 1251; another, 1315; another, 1318; another, 1335; another, 1348; another, 1389; another, 1438. See *Occurrences extraordinary hereafter.*
- Farquhar*, George, dramatic Author, born 1678, died *s* 1707
- Fasts* established in the Church 138
- Faux*, Guy, executed (for his Plot) in Parliament yard, aged 31 1606
- Ferrers*, Earl, hanged at Tyburn, for murdering his Steward 1760
- Feudal Law* begun 1070
- Flamstead*, John, Astronomer, born 1646, died 1719
- Fletcher*, John, dramatic Writer, born 1576, died 1625
- Forest*, New, made 1081
- Forest*, John, aged 42, burnt in Smithfield for denying the Supremacy, May 22 1538
- Fox,

- Fox**, George, Founder of the Quakers, appeared 1655
- Frederic**, Prince of Wales, arrived in England, Dec. 1729, died, aged 43, March 30 1751
- Friend**, Dr. John, born 1675, died 1728
- Frost**, hard one, Christmas, 1709, again 1739 G.
- Galen**, born at Pergamus about 131 died 201
- Garter**, Order of, instituted, April 23, 1349, underwent some Alteration 1552
- Garth**, Sir Samuel, died, January 1719
- Gay**, John, born 1688, died 1732
- Gibraltar** taken by Sir George Rook, July 24, 1704; besieged by the Spaniards (in vain) Fe. 27 1727
- Gladiators**, the Combats of them abolished by Constantine 325
- Greenland** discovered in the Reign of James I.
- Guildhall**, London, built 1410
- Gunpowder** first found out by a Monk of Cologne 1400
- Gunpowder-Plot** discovered, Nov. 5 1605
- Guns**, Use of, introduced 1382
- Gunter**, Rev. Edmund, Mathematician, died, aged 46 1616
- Guy**, Thomas, formerly a Bookseller, died, aged 79, Dec. 27, 1724. He left 200,000 l. for building an Hospital. H.
- Habeas-Corpus** Act passed May 27 1679
- Hailey**, Edmund, born 1656, died 1742
- Handel** (great Musician) died, aged 75, April 14 1759
- Havannab** taken, Au. 13 1762
- Hector**, Trojan Prince and General, died b 1184
- Helena** flourished b 1149
- Hephestion**, the Macedonian General and Favourite of Alexander, died b 325
- Heptarchy**, the Saxon, begun in the 6th Century, and continued till 800, when Egbert reigned alone.
- Herodotus** born, b 484, died b 413
- Hesiod**, lived b 944
- Hipparchus**, Astronomer, flourished between 160 and b 125
- Hippocrates** died, aged 98 b 361
- Hogarth**, William, died, aged 66 1764
- Homer**, born about 1041, flourished b 907
- Horace** born at Vendusium, b 65; died b 8
- Horrox**, Jeremiah, Astronomer, born about 1619
- Hudson's Bay** discovered by Cap. Hudson 1610
- Huygens**, Dutch Astronomer, born 629, died 1695
- I.
- Ireland** conquered by Henry II. 1172
- Isocrates**, Athenian Orator, died, aged 89 b 338
- Israelites** Departure out of Egypt, Tuesday, May 5, b 1491. Fed with Manna from Heaven, Thursday, June 4, same Year. Passed over to Jordan with Joshua, b 1451, according to Kennedy.—*Whose Week-Days and Month-Days are right,*
- by the Dominical-Letter Table, P. 14, Pall. 1772, but his Dates are doubtful.*
- Jamaica** taken 1655
- Jerusalem** taken by Nebuchadnezzar, after a Siege of 18 Months, June 9, b 587; destroyed, Aug. 31; b 70; taken by Robert, Duke of Normandy, who was there elected King of that City 1100
- Jesus Christ**, born Monday, Dec. 25, in the Year of the World 4005; in that of Rome 752; 4 Years before the common Æra; his first Ministry in 30; baptized by John, 30; celebrated his last Passover, and instituted his Sacrament, instead thereof, Thursday, Ap. 2; crucified April 3, at 3 in the Afternoon; rose April 5; ascended Thursday, May 14; all in 33. Kennedy.
- N. B. The Dominical Letter for 33 is D, and (by Tab. P. 15, Pal. 1772) April 2 is on a Thursday, and so is May 14, same Year; so that Kennedy is right in his Week and Month Days, in the reputed 33d Year of Christ. Who makes 37 Years of Age, at his Death, by adding 4 Years more to his reputed Years.
- * * * Instead of 1 Year before Christ, take 4 Years complete before the 1st of Christ, (or 4 Years sooner,) which will be December 25, in the 5th Year before Christ, to which the Dom. Let. O.S. for Dec.

- is A, (being Leap-Year,) therefore Dec. 25 (by Tab. P. 15, Pall. 1772) is on a Monday, according to Kennedy; if he is right in his Date; which is doubtful. — If Christ was born on Dec. 25 in the 4th Year before the common Æra, the Dominical Letter will be G, and the 25th of that December was on a Tuesday. But the 1st reputed Year of Christ has the Dominical Letter B, and Dec. 25 will be on Sunday, the Day of his Birth, more likely than on Monday. The Kennedians going a doubtful Number, of Years back, to get a Week-day to their Fancy.
- Joan d'Arc*, the Maid of Orleans, burnt for a Witch, June 14 s 1431
- Joddied*, aged 189 b 1533
- Johnson*, Ben, died, aged 62 s 1637
- Joseph* sold, b 1728; tempted by Potiphar's Wife, b 1718; made Governor of Egypt, b 1715; died in Ægypt, aged 110 b 1635
- Josephus*, Historian, died, aged 56 s 93
- Julius Cæsar* born July 10. b 100; invaded Britain, landing at Deal, Aug. 26, b 55; killed in the Senate-house, March 15 b 44
- Justin*, the Author, lived s 250
- Juvenal*, Poet, born s 45; died s 127
- K.
- Keil*, John, Astronomer, born 1671, died s 1721
- Kepler*, John, Astronomer, born at Wirtemberg 1571, died 1630
- Kent*, Maid of, executed at Tyburn 1534
- Kirby and Wade*, Captains, shot at Plymouth for Desertion, Apr. 14 1703
- L.
- Laertius* lived s 183
- Lambeth College and Chapel* founded by Hubert, Archbishop of Canterbury, about 1196
- Lazarus* raised from the Dead, s 33; died Dec. 17 s 63
- Lee*, Nathaniel, dramatic Author, flourished, s 1690; died aged 33.
- Leibnitz* born in Leipzig, 1646, died 1716
- Leland*, John, Antiquary, died 1552
- L'Estrange*, Sir Roger, born 1617, died 1705
- Library*, Alexandrian, of 400000 valuable Books, burnt by Julius Cæsar b 47
- Lily*, William, the Grammarian, died, aged 55 1523
- Lock*, John, (the Author,) born 1682, died Oct. 28 1704
- London* repaired by Alfred, s 885; burnt to the Ground, 982; nearly destroyed by Fire, 1077; again, 1130; again, 1666, when 13,200 Houses were consumed, a Year after the Plague.
- London-Bridge* built, about 1098
- Longinus*, the Orator, put to Death s 273
- Lotteries* first established s 1614
- Louisbourg* taken, July 27, 1757
- Lucan*, Author, born in Spain, Nov. 11, s 37; condemned and bled to Death in a hot Bath, April 30 s 64
- Lucretius* born at Rome, b 95; put an End to his Life in a raging Fit b 52
- Luther*, Martin, appeared, 1518; died 1546
- Lycurgus*, the Spartan Lawgiver, born b 926; established his Body of Laws in Lacedæmon, b 884; died in Crete b 872
- Lyfimachus*, the Macedonian General, died, aged 80 b 281
- M.
- Macedon*, Kingdom of, began under Caranus b 814
- Macedonian War* began b 200
- Macbiavel* died s 1530
- Macrobius* died s 415
- Madeira Island* discovered by the Portuguese s 1420
- Magna Charta* granted by King John, June 19 1215
- Mahomet*, the false Prophet, born at Mecca, May 5, 570; began to teach his Errors, 612; died June 18 s 631
- Manilla*, City of, taken from the Spaniards, July 27 1757
- Marcellus* died b 23
- Marlborough*, John, famous Duke of, died, aged 72, June 16 1722
- Marriage-act* passed 1753
- Martial*, born at Bilboa, s 34; died s 109
- Massacre*, Irish, when 40,000 English Protestants were inhumanly murdered s 1641
- of Glencoe, Fe. 13 1693
- Mazarine*,

Maxarine, Cardinal, died, aged 59 s 1661
Mead, Dr. Richard, born 1673, died 1754
Mecenas died b 8
Metbusalem, the longest Liver, died a little before the Flood, aged 969, in 1656 of the World.
Militia bill passed 1757.
Milton, John, born 1608, died blind 1674
Minorca taken by General Stanhope, August, 1708; surrendered to the French, Jun. 1756
Mitridates ordered all the Romans that were in Asia to be put to Death b 88
Monk, General, Arbitrator of England's Fate, 1659; made Duke of Albemarle, July 12 1660
Monmouth, Duke of, invaded England, June 11, 1685; proclaimed King at Taunton, June 20 following; defeated near Bridgewater, July 5; beheaded on Tower-hill, July 5 following, aged 35.
Moorfields made into Walks 1614
Moses born, b 1571; sent the 10 Plagues of Egypt, b 1491; about the same Time brought Water out of the Rock; saw the burning Bush the same Year; received the Tables of Stone on Mount Sinai, May 4, b 1491; died b 1451
Museum established 1753

N.

Navy-Office founded, Dec. 4 1644
Nero murdered his Mother s 55

Newton, Sir Isaac, born Dec. 25, 1642, died March 20 1726
Noah directed to build the Ark, 1536 of the World, 120 Years before the Flood; died, aged 950 b 1998
Norwich, City of, burnt and destroyed by Sweyn K. of Denmark 1004
Nova Scotia peopled from England 1749

O.

Orlando Furioso died 772
Oughtbryd, Rev. Wm, born 1573, died 1660
Ovid born at Sulmo, b 43, died s 35
Oxford University founded by Alfred s 886

P.

Pantheon at Rome built by Agrippina b 25
Par, Thomas, died, aged 152, 1635. He lived in 10 Kings Reigns.
Paracelsus died, aged 48 s 1447
Paris, Matthew, Historian, died s 1259
Parliament, 1st, in King John's Reign, the Epoch of the House of Commons, Jan. 20, 1265; the first British one met Oct. 24 1707
Parmenides, Philosopher, lived b 505
Paschal, Blaize, Bishop, born at Auvergne 1623, died 1662
Patrick, 1st Bishop in Ireland, died, aged 122 491
Paul's, St. in London, built by Ethelbert, K. of Kent, on the Foundation of an old Temple of Diana, 596; burnt, 964; rebuilt and consecrated, 1240, having been 150 Years building; rebuilt, ha-

ving been burnt down 1631

Peloponesean War, which continued 27 Years, began b 431

Pericles, Athenian General, died, aged 70 b 429

Peter I. Czar of Russia, died, aged 53 1725

Phaedrus born, b 47; died s 31

Pharaoh ordered all the male Children of the Hebrews to be destroyed, b 1573; drowned with his Host in the Red-Sea, Monday, May 11 b 1491

Physicians College, London, founded 1519

Pilate made Governor of Judea, s 27; slew himself s 40

Pindar, Poet, died, aged 80 b 435

Plague visited almost the whole World b 767

— A great one in Rome, which carried off 10 Thousand People in a Day s 78

— The Western Parts of England (particularly Oxford) greatly afflicted with one 1571

— July 9, 1397, the Sun appeared to be obscured by certain thick and dreary Clouds between him and the Earth. These Clouds rose daily for 6 Weeks together. The North and East Parts of England, at this Time, were afflicted with a Pestilence. In a few Weeks died 11000 Persons in the City of York.

— in England, 1247; again, 1347; in Germany, which cut off 90,000 People, 1348; in Paris and London, very dreadful, 1362; again,

again, 1379; one in England, when 30000 died in London, 1407; again, when more were destroyed than in 15 Years War, 1477; again, when 30,000 died in London, 1499; again, 1548; again, 1594; again, in London, which carried off the Fourth of its Inhabitants, 1604; at Constantinople, when 200,000 died, 1611; again, at London, when 35417 died, 1625; at Lyons, in France, where 60000 died, 1632; again, at London, when 68000 perished 1665
Plato died, aged 80 *b* 348
Plautus died *b* 184
Pliny II. died, aged 56 *s* 74
Pliny the younger lived *s* 59
Plutarch died *s* 119
Plymouth burnt by the French 1377
Polybius born *b* 205
Pomfret, Rev. Mr. died young 1709
Pompey killed in Egypt by Order of Ptolemy *b* 48
Pope, Alexander, died, aged 55 1744
Portobello taken by Admiral Vernon, Nov. 12 1739
Portsmouth burnt, 1265; again by the French 1377
Post-Office, General, established, December 27 1660
 — Penny Ditto 1683
Predestination established by Lucidus, a Priest of Gaul *s* 470
Priam, King of Troy, died *b* 1184
Prideaux, Humphry, born 1648, died 1724

Printing first made public by one John Faustus, a Goldsmith of Mentz, 1458; first brought into England by William Caxton, a Mercer of London 1471

Prior, Matthew, died, aged 56, Sep. 18 1721
Puffendorf died, aged 62 1694

Punic War, first, commenced, *b* 264; 2d, *b* 218; 3d *b* 149
Pythagoras died, aged 80 *b* 497

Q.

Quebec taken, Se. 13 1759
Quintilian died *s* 95

R.

Rabelais, Francis, born 1483, died 1553
Raleigh, Sir Walter, beheaded in Old-Palace-Yard, Westminster, aged 65, Oct. 29 1618

Rapin de Thoyras died, aged 64, May 16 1725
Ravillac murdered Henry IV. of France, May 14 1610

Reformation begun, 1530, completed 1547

River, New, brought to London 1614

Robin Hood and Little John, great Robbers in Nottinghamshire 1189

Rocheſter, Wilmot Earl of, died, aged 32, July 26 1680

Rocheſter, City of, burnt 1137

Rollin, Charles, died, aged 80 1741

Rome founded, April 20, *b* 753; Romulus first King; its Capitol burnt *b* 83

Rosamond, Miſtreſs to Henry II. 1172; ſhut up at Woodſtock 1189

Roscommon, E. of, died 1684

Rowe, Nicholas, died, aged 44, Dec. 6 1718
 — Elizabeth, died, aged 63, Feb. 20 1737
Roxana, and her Son Alexander, deſtroyed by Caſſander *b* 311
Rubens, Paul, born 1577, died 1640
Ruſſworth, Joſeph, born 1607, died 1690

S.

Sabines, the Rape of the, by the Romans *b* 750

Sackville, Lord George, tried, Aug. 15 1760

Salluſt died *b* 34

Salt Duties formed, June 15 1702

Samſon pulled down the Temple of Dagon, and deſtroyed 3000 Philiftines, *b* 1117, having been Iſrael's Avenger for 20 Years.

Samuel born, *b* 1139, died *b* 1061

Sanderson, Mathematician, born 1682, died 1739

Sappho lived *b* 603

Saul, 1ſt King of Iſrael, began to reign, *b* 1095, killed himſelf *b* 1055

Scaliger, Julius Cæſar, died, aged 75 *b* 1558

Scipio, Cn. took the two Camps of Aſdrubal and Syphax, killed 40,000 of their Men, and took 6000 Priſoners *b* 214

Sea-Fight, in the Downs, with the Dutch, June 19 1652

— near Portland, with the Dutch, who were beaten, Feb. 18 1653

— with the Dutch, June 2, ſame Year.

— again, July 19, ſame Year,

— with the Dutch, June 3, 1664, when the Engliſh conquered.

Sea-Fight,

- Sea-Fight*, of four Days, June 4 1666
 — Victory of the English, Jul. 25 following.
 — with the French, when their Ships were burnt near Martinico, June 25 1667
 — at Solebay, May 28 1672
 — with the Dutch, May 28 1673
 — with the Dutch, June 4, same Year.
 — at the Texel, August 11 1673
 — English and Dutch beat by the French off Beachy Head, Jun. 30 1690
 — French beat off La-Hogue, May 19 1692
 — Spaniards beat by Sir George Rook, Oct. 12 1702
 — French Fleet destroyed by Sir George Byng, Aug. 11 1718
 — off Toulon, Feb. 9 1744
 — of Admiral Hawke 1759
Semiramis, Queen of Assyria, died *b* 1965
Seneca born at Corduba, in 1 of Christ, died 64
Shadwell, Thomas, born 1640, died Nov. 20 1692
Shakespeare, William, born 1564, died April 23 1616
Shem, Son of Noah, died, aged 600 *b* 1846
Shore, Jane, Mistress of Edward IV. did Penance 1483
Shovel, Sir Cloudesly, lost on the Rocks of Scilly, aged 56, Oct. 22 1767
Sicily first peopled from Italy *b* 1292
Simonides, Poet, flourished *b* 503
Sloan, Sir Hans, born 1660, died Jan. 11 1752
Socrates, Philosopher, put to Death by Poison, aged 70 *b* 400
Sodom burnt, in the 65th Year of Lot's Age *b* 1897
Solomon born, *b* 1043; succeeded his Father David on the Throne, *b* 1015; laid the Foundation of the Temple, May 21, *b* 1012; finished it, *b* 1008; dedicated it, Friday, Oct. 30, *b* 1000; wrote his Ecclesiasticks, *b* 981; died *b* 975
Solon died, aged 80 *b* 640
Sophocles died, aged 90 *b* 406
South-Sea Act passed, May 6, 1716; its Bubble 1720
Stamp-Duties instituted, June 28 1624
Star-Chamber, Court of, instituted 1487, abolished 1641
Steel, Sir Richard, died, aged about 53, Sep. 21 1729
Style altered by Augustus Cæsar, who ordered Leap Year once in 4 Years, and the Month Sextilis to be called Augustus, *b* 8; again, at Rome, by taking 12 Days off the Calendar, 1582; again, at London, by taking 11 Days off the Calendar, Sep. 2, 1752, making the 2d the 13th of September.
Suetonius, Historian, flourished, *s* 110, died 117
Suidas lived *s* 1087
Sweden, Gustavus Adolphus, King of, killed at the Battle of Lutzen, Nov. 16 1632
 — Charles XII. of, shot in Battle, aged 30, Dec. 11 1718
Swift, Dean, died, aged 78, October 1745
Sydenham, Dr. Thomas, died, aged 65, Dec. 29 1689
Sylvester, Joshua, died, aged 55 1618
Syfygambis, Mother of Darius, on hearing of the Death of Alexander at Babylon, starved herself to Death *b* 324
 T.
Tacitus alive *s* 97
Tamerlane, Conqueror of Asia, born at Keck, *s* 1336, died 1405
Tasso died, aged 51 1595
Terence died, aged 64 *b* 159
Tbales, Philosopher, born *b* 640, died *b* 572
Tbucidides, Athenian General, banished by Ostacism, aged 26 *b* 444
Tibullus born, *b* 43, died *b* 11
Timoleon, of Syracuse, died *b* 337
Tobacco first brought to England *s* 1583
Toleration Act passed 1689
Tower of London built *s* 1080
Trade and Plantation Office formed, Nov. 7 1660
Troy new built, *b* 1255; burnt, June 12, at Night *b* 1184
Turkey Company established 1579
Tycho Brabe, of Denmark, born 1546, died 1601
Tyler, Wat, Rebel, killed by Walworth, Mayor of London 1381 U.
Ulysses flourished *b* 1149
Union of England and Scotland, May 1 1707
Vanburgh, Sir John, died, March 26 1726
 Vandyck

<i>Vandyck</i> born at Antwerp, 1599; died at London 1641	<i>West-Indies</i> discovered by Columbus 1493	<i>Woolaston</i> , Rev. William, (Improver of moral Truth,) born 1659, died 1724
<i>Varro</i> , Terentius, died, aged 88 b 28	<i>Westminster-Abbey</i> built by Sebert, King of Essex, on the Spot where the Temple of Apollo once stood, about 1600; its Monastery consecrated by Edward the Confessor, 1065; rebuilt and consecrated 1269	<i>Woolston</i> , Thomas, (Latitudinarian,) born 1669, died 1733
<i>Venice</i> took its Rise, 1452; reduced to Ashes 1101	<i>Westminster-Hall</i> built, about 1098, rebuilt 1399	<i>Wren</i> , Sir Christopher, died, aged 90 1723
<i>Vespasian</i> conquered the Isle of Wight 43	<i>Westminster-Bridge</i> opened, Nov. 17 1750	<i>Wycberly</i> , William, born 1640, died 1715
<i>Vitzalling-Office</i> instituted, Dec. 10 1663	<i>Whiston</i> , William, Astronomer, born 1667, died 1752	X.
<i>Virgil</i> born at Andes, near Mantua, b 69; died at Brundisium in Italy b 18	<i>Whittington</i> , Sir Richard, Lord Mayor of London 1377	<i>Xenophon</i> died at Corinth, aged 90 b 359
<i>Virginia</i> planted by the English 1608	<i>Wingate</i> , Edmund, died, aged 61, Dec. 16 1656	Y.
<i>Virginius</i> kill'd his Daughter to prevent her falling a Prey to Claudius b 449	<i>Wolf</i> , General, killed, aged 33, at the taking of Quebec 1759	<i>York City and Cathedral</i> burnt by the Danes, 1069; burnt again 1179
W.	<i>Wolffius</i> , Mathematician, died, aged 64 1805	<i>Young</i> , Dr. Edward, died, aged 81 1765
<i>Walpole</i> , Sir Robert, afterwards Earl of Orford, born 1674, died 1745		Z.
<i>Walsh</i> , Poet, born 1659, died 1708		<i>Zechariah</i> flourished b 520
		<i>Zeno</i> died, aged 98 1264
		<i>Zephaniah</i> , the Prophet, flourished b 641
		<i>Zoroaster</i> flourished b 2066

KINGS of ENGLAND *since the Heptarchy, and the Years they reigned.*

Began to reign.	Names.	Reigned Y. M.	Began to reign.	Names.	Reigned Y. M.
800	Egbert, of West Saxons	38 0	1087	William II.	13 0
838	Ethelwulf — —	19	1100	Henry I. — —	35
857	Ethelbald — —	3	1135	Stephen — —	19
860	Ethelbert — —	6	1154	Henry II. — —	35
866	Ethelred I. — —	6	1189	Richard I. — —	10
872	Alfred — —	29	1199	John — —	17
900	Edward the Elder — —	25	1216	Henry III. — —	56
925	Athelstan — —	17	1272	Edward I. — —	35
942	Edmund I. — —	4	1307	Edward II. — —	20
946	Eder — —	9	1327	Edward III. — —	50
955	Edwy — —	4	1377	Richard II. — —	23
959	Edgar — —	16	1399	Henry IV. — —	13
975	Edward the Martyr — —	4	1412	Henry V. — —	10
979	Ethelred II. — —	7	1423	Henry VI. — —	39
1016	Edmund II. — —	0 7	1461	Edward IV. — —	22
1017	Canute, K. of Denmark	22	1483	Edward V. — —	0 5
	<i>Harold, Usurper</i> — —	5	1483	Richard III. — —	2
1039	Hardycanute — —	2	1485	Henry VII. — —	25
1041	Edward the Confessor	25	1508	Henry VIII. — —	38
1065	Harold, Usurper — —	1	1547	Edward VI. — —	6
1066	William the Conqueror	21	1553	Mary — —	5

1558 Elizabeth

<i>Began to reign.</i>	<i>Names.</i>	<i>Reigned Y.</i>	<i>Began to reign.</i>	<i>Names.</i>	<i>Reigned Y.</i>
1558	Elizabeth — —	44	1688	William and Mary	14
1602	James I. — —	25	1702	Anne — —	12
1625	Charles I. — —	24	1714	George I. — —	12
	<i>Cromwell, Ufurper.</i>		1727	George II. — —	33
1649	Charles II. — —	25	1760	George III.	
1684	James II. — —	4			

KINGS of SCOTLAND, and the Years they reigned.

<i>Began to reign.</i>	<i>Names.</i>	<i>Reigned Y.</i>	<i>Began to reign.</i>	<i>Names.</i>	<i>Reigned Y.</i>
422	Fergus — —	18	904	Constantin III. — —	39
440	Eugenius I. — —	21	943	Malcolm I. — —	15
461	Dongard — —	4	958	Indulphus — —	10
465	Constantin I. — —	17	968	Duphus — —	5
482	Congale I. — —	19	973	Cullenus — —	5
501	Conran — —	34	978	Kennet III. — —	17
535	Eugenius II. — —	33	994	Constantin IV. — —	2
568	Congale II. — —	10	995	Crimus — —	8
572	Chinaule or Cumatillus		1003	Malcolm II. — —	30
580	Aldan — —	26	1033	Duncan — —	7
606	Clenet — —		1040	Macbeth, Tyrant — —	17
606	Eugene III. — —	14	1057	Malcolm III. — —	36
620	Ferchard I. — —	12	1093	Donald VII. — —	1
632	Donald — —	15	1094	Duncan II. — —	2
647	Ferchard II. — —	17	1096	Edgar — —	10
668	Malwin — —	20	1106	Alexander I. — —	18
688	Eugenius IV. — —	4	1124	David — —	29
692	Eugenius V. — —	7	1153	Malcolm IV. — —	12
699	Amberchelet — —	2	1165	William — —	49
700	Eugenius VI. — —	17	1214	Alexander II. — —	35
717	Mordac — —	13	1249	Alexander III. — —	36
730	Etsinius — —	31	1285	<i>Interregnum</i> — —	7
761	Eugenius VII. — —	3	1292	John Baliol — —	14
764	Fergus II. — —	3	1306	Robert I. — —	23
767	Solvatius — —	20	1329	David II. and Richard	41
787	Achanis — —	22	1370	Robert II. — —	20
809	Congal III. — —	5	1390	John Robert — —	33
814	Dongal II. — —	6	1423	James I. — —	14
820	Alpin — —	3	1437	James II. — —	23
823	Kenet II. — —	31	1460	James III. — —	28
854	Donald V. — —	4	1488	James IV. — —	25
858	Constantin II. — —	16	1513	James V. — —	29
874	Ethus I. — —		1542	Mary Stewart — —	25
875	Gregory — —	18	1567	James VI. — —	58
893	Donald VI. — —	11			

The Successors of James VI. became Kings of England till 1707, when the two Kingdoms were united.

*** In our next Palladium, 1774, we propose to insert an Alphabetical Chronicle, Number III. of the Emperors of Rome, (their Beginning to reign and Time of reigning,) from the Foundation thereof, (753 Years before Christ); the first and last Kings, in foreign Kingdoms, as far as they are known; and other curious and useful chronological Accounts, mentioned at P. 28, last Year's Palladium.*

On the BEAUTIES of a real Friend, and DEFORMITIES of a pretended One.
The WISDOM of the SON of SIRACH. (See Ecclesiasticus.)

WE should have many Well-wishers, but *few* Friends. Sweet Language will multiply Friends, and a fair-speaking Tongue will encrease kind Greetings. Be in Peace with Many, nevertheless have but *one* Counsellor of a Thousand.

Many Friends are not unlike to having many *Wives*; seldom but *one*, (and sometimes not *that*;) can be trusted. A Multitude of fair-spoken *Acquaintances*, are not unlike a Number of *fair Deceivers*.

If thou wouldst get a *Friend*, prove him first; and be not hasty to credit him; for some Men are Friends for their own Occasion, and will not abide in the Day of Trouble: And there is a *Friend*, who, being turned to Enmity and Strife, will discover thy *Reproach*. Some *Friends* are Companions at a *Table*, and will not continue in the Day of thy *Affliction*; but, in thy *Prosperity*, he will be as thy *Self*, and will be bold over thy Servants. If thou be brought low, he will be against thee, and hide himself from thy Face. — Separate thyself from thine Enemies, and take Heed of thy Friends.

A *faithful Friend* is a strong Defence, and he that has found such an one hath found a *Treasure*. Nothing doth countervail a *faithful Friend*, and his Excellence is invaluable. A *faithful Friend* is the *Medicine* of Life; and they that fear the Lord shall find him. Who so feareth the Lord shall direct his *Friendship* aright; for as he is, so shall his Neighbour (that is, his *Friend*) be also.

Forsake not an old *Friend*; for the *new* is not comparable to him. A *new Friend* is as *new Wine*; when it is old thou shalt drink it with Pleasure.

Who so casteth a *Stone* at the Birds frayeth them away; and he that *upbraids* his *Friend* *breaketh* *Friendship*.

Though thou drawest a *Sword* at a *Friend*, yet despair not, for there may be a returning to Favour: If thou hast opened thy Mouth against thy *Friend*, fear not, for there may be a Reconciliation; except for *Upbraiding*, or *Pride*, or *discussing* of *Secrets*, or a *treacherous Wound*; for, for these Things every *Friend* will depart.

Who so *discovers* *Secrets* loseth his *Credit*, and shall never find a *Friend* to his Mind. Love thy *Friend*, and be faithful unto him; but if thou betrayest his *Secrets*, follow no more after him: For as a Man hath *destroyed* his *Enemy*, so hast thou lost the *Love* of thy *Friend*; as one that letteth a *Bird* go out of his *Hand*, so hast thou let thy *Friend* go, and shalt not get him again: Follow after him no more, for he is too far off; he is as a *Roe* escaped out of the *Snare*. As for a *Wound*, it may be bound up; and after *reviling* there may be Reconciliation; but he that *betrayeth* *Secrets* is without *Hope*.

Of LAW and LAWYERS. According to an eminent Author.

IF a *Lawyer* were to be esteemed only as he uses his Parts in contending for *Justice*, and were immediately *despicable* when he appeared in a *Cause* which he could not but know was an *unjust one*, how honourable would his *Character* be! And how honourable is it in such among us, as follow the Profession no otherwise than as labouring to *protect* the injured, to *subdue* the Oppressor, to *imprison* the careless Debtor, and to do Right to the painful Artificer! But many fall short of this excellent *Character*, by the greater Number, who affect covering a *weak Place* in a *Client's Title*, diverting the Course of an *Enquiry*, or finding a skilful Refuge to *paliate* a *Falseness*: Yet it is still called *Eloquence* in the Lawyer, though thus *unjustly* employed: But *Resolution* in an *Assassin* is, according to Reason, quite as laudable, as Knowledge and Wisdom exercised in the Defence of an *ill Cause*.

Were

Were the *Intention* steadfastly considered, as the Measure of Approbation, all *Falseness* would soon be out of Countenance; and an *Address* in imposing upon Mankind would be as *contemptible* in one State of Life as in another. A Couple of *Courtiers*, making Professions of Esteem, would make the same Figure, after Breach of Promise, as two *Knights of the Post*, convicted of Perjury. But Conversation is fallen so low, in Point of Morality, that, as they say in a Bargain, *Let the Buyer look to it*; he is the Man in Danger *who is most apt to believe*: He is the more likely to suffer, in *Commerce*, who begins with the *Obligation* of being the more ready to enter into it.

OF INJURY.

1. INJURY is the Bane of Friendship, and all *mutual Engagements*.
2. It is doing *Injustice* to a Man unwilling to receive it.
3. It consists in *charging* falsely, as well as *detracting* unduly.
4. To charge a Man *falsely* with Evil, of which he is ignorant, putting *stolen Goods* upon him, and stealing his *Property*, is a *double Injury*; beginning with *Murder*, and ending with *Theft*: The first like *biting* before he *barks*; and the other like *barking*, and *biting* afterwards.
5. All the *Mischief* in the World proceeds from the doing, or apprehending, *Wrong*, from Men, *originally* unjust or suspicious.
6. Were *Right* and *Justice* exactly preserved, our Earth would be a *Paradise*; and the Lives of Men, now, would be like *primitive Innocency*: *Felicity* would still vouchsafe to dwell with us, that now, like *Ashrea*, is fled to Heaven.
7. Were *Injuries* forborn, how many Journeys and Attendancies, how much Treasure, now expended, and Trouble undergone, would be saved! No crowded Throgs need fill the *Law Tribunals*; no Need of *armed Justice* to secure us in our Rights and Properties.
8. Every *Injury* committed, is the Beginning of a *petty War*; often occasioning a *Breach* of two Commandments, *killing* and *stealing*.
9. To avoid Evil, and do Good, is one conjunctive Precept.
10. The *Priest* and *Levite* were both censured, though they did no *Injury* to the Man that fell among the *Thieves*, because they passed by him without doing him Good in his *wounded* Condition.
11. *Uncharitableness* is an *Injury*, when it is in our Power to do *Good*.
12. Some *Callings* are difficult to hold, and be just.
13. For Man, by all the *Laws of Creation, Policy, and Religion*, is restrained to live on what is *justly* his own, acquired by his *fair Industry*; whence his Blessing proceeds.
14. Who act on contrary *Principles* may flourish for a While, but, like the *counteracting Wheel* of a Machine, to the general Motion and End of the Whole, goes to Decay, or is rejected.
15. *Injury* was a detestable Vice among the *Romans*; their *Virtue* was above it in all *Emergencies*.
16. When King *Pyrrhus* pressed, with his Army, even to the Gates of *Rome*, and his Physician offered to poison him, to gratify the *Romans*, they sent the *perfidious* Man, bound, to his Master, with an Account of it.
17. When C. *Decimius*, the Tribune, intended to cite Prince *Scurus* before the public *Tribunal*, he cropt off the Bars of that Prince's Servant, and sealed up his Lips, and, in that Condition, sent him to his Master, for offering to discover so much of his Secrets as would condemn him.
18. Though *Religion* is pure and peaceable, yet *Wrong* and *Injury* scandalise its Professors.
19. *Injury* is the *Fuel* of War; and, by doing it, we help our Adversary, and war against ourselves.

20. God is engaged on the Side of the *injured Party*; disadvantageously; by our Injustice, against our *own Cause*.

21. *Injury* is done, and sometimes *Good* comes of it.

22. *Justice* requires no *Injury* to procure it *Victory*; which has ever been *disdained* by just and gallant Persons of Honour, however plausible and practicable it may seem to some *Heroes*.

23. He that tolerates himself to do *Injuries*, makes his *Favours* to be suspected for *Snares*.

24. He is so far from being a *propitious Star*, that the *Malevolence* of a *Comet*, prefiging Destruction, harbours in him.

25. Who is not *principled* to forbear doing an *Injury*, is far from being inclined to do *Good*; but is ready to step over the *Threshold* of Oppression.

26. He deceives himself, who thinks to gain Favour, either with God or Man, who makes *Religion* consist in the *Formalities* and *Exteriors* of it, and gives a Loose to the Reins of *Injury*; seeing that he is an *Enemy* to both, in dishonouring God, and hurting Man.

27. *Socrates*' Opinion was, rather to suffer *Wrong*, than do it to another: *That* he might be a good Man who suffered it, but must be a bad one that offered it.

Of civil CONTRACT and JUSTICE.

1. WE ought *religiously* to keep all solemn Promises and Covenants, though made to our *Disadvantage*; notwithstanding afterwards we perceive they might have been better ordered.

2. No preceding solemn *Act* should be altered by any after *Accident*.

3. Nothing should make Men break their solemn *Promise* made one to another.

4. *Civil Contract* is a Part of *Justice*, depending on the Laws of Man *directly*; and upon the Laws of God only by Consequence and *indirect* Reason.

5. From *civil Laws*, or private Agreements, *civil Contract* takes its Estimate and Measures.

6. In making *Contracts*, a Multitude of Words should not be used; since the Business of all Bargains is summed up in few Sentences.

7. In *Contracts*, he that speaks *least* is ever understood to mean *fairest*, as having the fewest Opportunities to deceive.

8. *Equivocate* neither in small or great Matters.

9. Pretend not what is *false* to conceal what is *true*.

10. Let the Measure of your *Affirmation* or *Denial* be the plain and direct Meaning of your *Contract*.

11. In bargaining, you must not only avoid what is *false*, but also what is *deceitful*.

Of HONESTY and OPPRESSION.

1. A Man ought not in *Conscience* to take Wages, or a Fee, for executing a Business or Work, that he is sensible is *not in his Power* to perform.

2. No Man should undertake a Business for another, without declaring before Hand his sincere Opinion of the Prospect he has of the Advantage or Disadvantage therefrom; that the Person, for whom he is to undertake it, may be at his *Discretion*, either to entertain or decline employing him.

3. A *generous-minded* and *honest* Man will not be prevailed upon to raise the Price of his *Rents*, to the Distress of *Families*, in Regard either of *Accident*, or Advantage to himself.

4. A *Prince* must be treated *conscientiously* as well as a common Person; and a *Beggär* must be treated *justly* as well as a *Prince*.

5. To poor Persons, the utmost Measure and Extent of Justice is *unmerciful*, which to the *rich* is *inoffensive* and *just*; because he wants neither Mercy or Remission.

6. Man

6. Men should not, on Account of Poverty, become oppressive and cruel in their Bargains with Others.

7. Men should shelter their Estates under the Influence and Protection of the divine Providence; leaving the Interest and Success therein (after necessary human Precautions) to God, for procuring Blessing and Recompence.

8. If this Resignation to divine Providence cures not Poverty, it will take away the Evil of it, and ease Trouble.

9. By the Dictates of Conscience, we cannot (*whatever we may pretend*) appropriate, to our private Use, what God, or the Republic, has made or intended for the common Good; for such an Act would be against Justice and Charity.

10. When the King of Naples inclosed the Gardens of Oenotria, where the best Manna of Calabria used to fall, that no Man might gather it without paying Tribute, God's Displeasure at the Action appeared, in its ceasing to fall till the Tax was taken off, and then it fell as before.

11. When the Procurators of King Antigonus laid a Tribute on the Sick that came to drink the healing Waters of Edapsus, (being the Bounty of God's Providence,) they immediately dried up; which admonishes Men against using Oppression.

12. St. Paul saith, 1 Thess. iv. 6. Let no Man go beyond or defraud his Brother in any Matter; because the Lord is the Avenger of all such.

13. It is Nothing new to observe, that such as have oppressed or defrauded others, have themselves felt the ill Consequences of their unjust Dealings: This Uncleaness of Oppression and unjust Dealings has proved as a Canker-Worm, eating up all the other Increase.

14. This Kind of Injustice has procured Beggary, and a declining Estate; with an ill Name and Curses from the Injured! Or sometimes procured a foolish or prodigal Heir to scatter abroad an ill gotten plentiful Estate; and is a Vice that carries with it its own Punishment, and therefore should be carefully avoided.

Of LIBERTY.

1. LIBERTY is the Desire of all Creatures.

2. Nature is burthenfome under Restraint.

3. Our daily Supplies would be tasteless without Liberty.

4. Liberty is clear of private Dependences.

5. It consists in a Latitude of Practice, within the Limits of Law and Religion.

6. He, who is Master of his Time, can chuse his Employ and Diversions.

7. He who can avoid disagreeable Company, when his Humour or Occasion requires it, is as free as, in Reason, he can wish for.

8. Servitude, from Necessity, supplies the Wants of Nature.

9. It is only to be borne and dispensed with when unavoidable.

10. Death, in Time, will knock off the Chains of Servitude, and set all Men at Liberty.

11. When the Necessities of Life can be had a cheaper Way, it is great Folly to purchase them at the Loss of Liberty.

12. He who sacrifices his Liberty to his Palate is a Slave to Voluptuousness and himself.

13. Some Men derive Liberty from any Condition, and think themselves freer than those they serve.

14. A Gaul being asked how he could live a Servant to Zeniades, answered, That a Lion does not serve his Keeper, but his Keeper serves him.

15. When Diogenes was told that Calisthenes appeared splendid, and dined with Alexander, (the King,) he answered, That Calisthenes was forced to dine when Alexander pleased, but himself when Diogenes pleased.

16. *Servitude* is more troublesome than Nature ever intended it, by the wanton Exercise of Power over Inferiours.
17. *Liberty* affords great Opportunities for the Improvement of *Reason*.
18. It gives Leisure for *Reading* and *Contemplation*; for Acquaintance with Men and Things; and for looking into the *History* of Nature and of the Times.
19. He that has the *Business* of Life at his own *Disposal*, and has none to account to but *God* and *himself*, for the Minutes that are bearing him off in the *Stream* running to *Eternity*, may be happy without *slaving* for it.
20. He need not flatter the *Vain*, be tired of the *Impertinent*, nor stand in *Awe* of the Courtesy of *Knavery* and *Folly*.
21. To be at one's own *Disposal*, is to lie under no *Anxiety* for Fear of *displeasing* others.
22. To be *free*, is to have no better or changeable Temper to struggle with, and to be *independent* of any one's *Vilage*.
23. When a *Smile* will not exalt, nor a *Frown* amaze, such an one's Fortune is fixed higher than when *affected with*, or *concerned at*, the Pleasure of the *Nice* and *Variable*.
24. The *Independency* of *Liberty* gives Ease to the Mind, and Vigour for *Imagination* and *Enterprize*.
25. The Man of *Freedom* has Nothing to strike a Damp upon his *Genius*, overawe his Thoughts, or check the Range of his Fancy.
26. He that is *embarrassed* in his *Liberty* is apt to be wavering in his Pursuits and Actions, palled and dispirited in his Conceptions and Humour; so that you may read his *Condition* in his Behaviour and Conversation.
27. When *Greece* was first enslaved under the *Macedonians*, and next under the *Romans*, *Longinus* observes, that there were no considerable *Orators* found among the *Greeks*; as if the Channels of *Rhetoric* were dried up, the Force of *Demosthenes* spent, and the *Springs* of the *Muses* exhausted, with the languid and expired Government.
28. The active Spirit of Man struggles, in the narrow Inclosure of its *Cloy-Mansion*, to enlarge its *Liberty*.
29. All Things aspire to *Liberty* and an *uncontrouled Freedom*; for every Creature is prompted by Nature to be like THAT whence it is derived.
30. Look over all the World, and you will see *all Things*, as far as they can, endeavouring to imitate the *ALMIGHTY*.
31. The *Liberty* of the human Spirit exalts in a Freedom that cannot be *restrained*.
32. If a Person were Nothing but *Soul*, he need not be under any *Subjection* to others for supporting it.
33. A *Body* is a very indigent Sort of Thing, and cannot subsist upon its own Growth, but is in *Need* of continual *Supplies*.
34. *Eating* and *Drinking* are therefore a cruel *Cbeck* upon the *Dignities* of Men, jostle them out of the Line of *Liberty*, and make them hold their *Lives* by a *servile Tenure*; so that each Person must learn the Lesson of *Content*, in that Station wherein *Providence* has placed him.
35. *Liberty* is exceedingly to be *prized*; but, where *Necessity* restrains it, a calm Temper of Mind must supply its *Defect*, by making a *Virtue* of that *Necessity*.
36. Enjoying perfect *Liberty*, you may rest *happy* in the Privileges arising from it.
37. If you want perfect *Liberty*, Melancholy should not be suffered to generate a *viperous Brood* of *Discontents* in your Breast.
38. *Content* yourself, as much as you can, in the *Defect* of *Liberty*.
39. In any State of *Liberty*, higher or lower, *Content* should never be a *Stranger*.

Miscellaneous OBSERVATIONS.

1. RICHES (being the *contrary* Extreme to *Poverty*) are generally attended with *proportionable* Troubles.

2. The Possessors of *great Riches* often sacrifice their *Healts* to their Abundance ; and, by an ill Use of *Plenty*, find no *Satisfaction*.

3. Honours and Promotions, Profits and Distinctions, among Men, will be reduced to an *Equality* in a few Years.

4. *Luxury* and *Intemperance*, *Pride* and *Indolence*, are the *grand Enemies* to Reason and Understanding.

5. The *larger* the Acquaintance, (where the *Heart* is divided among *so many*,) the less the *Sincerity* and *Friendship* will be found for *any*.

6. An *unfit* Acquaintance is an *unfit* Friend.

7. The *Phoenix*, *black Swan*, *Unicorn*, *Philosopher's Stone*, and *Masquerade-Longitude*, are five great *Rarities* not yet discovered.

8. A *little* great Man, and a *great* little Man, are two great *Prodigies*.

9. *Fame*, gathering as it flies ; a *Musquet Ball*, that kills before the Report is heard ; *Light*, that flies over immense Space in 6 or 7 Minutes ; and *Lightning*, that kills, in an Instant, the Child in the Womb, without hurting the Mother, and melts Gold in a Purse, without singeing it, or damaging the Owner, are five wonderful Effects of *Swiftness*.

PART II.

ANSWERS to all the ÆNIGMAS in last Year's PALLADIUM.

I. A FEATHER.

V. A NUT.

VIII. A Seaman's NEE-

II. NUT-CRACKERS.

VI. ABBA, signifying

DLE and COMPASS.

III. BEAUTY.

Father.

IX. A Pair of TONGS.

IV. A LEVEL.

VII. The Letter X.

Prize. A CHURN.

All the above were answered by Mr. I. Scott, of Cawthorne ; also by Mr. Richard Dalton, of Pool.

All the ÆNIGMAS answered by Gemini, of Morpeth.
To SINCERITY.

1. Thou Bond of Friendship, Bond of Love !

What *Beauties* flow from thee !

3.

Thee, all the Good and Wise approve,

O blest Sincerity !

2. Inspir'd by thee, we dare to soar,

Our grateful Homage pay,

To Him, Creation must adore,

And humbly cry *Abba* !

6.

3. The homely Dame, who tends her Churn,

Prize.

Connubial Joys may find,

When Thou each Action dost adorn,

Possessing Heart and Mind.

4. 'Tis by the Level we must try

4.

A Friend, before we trust ;

Like a *cracks Nut*, we throw him by,

When to Thee he's unjust.*

* Broken Friendship, like broken China, will never ring well, whoever first divides the original Cement.

5. Crabbed

5. Crabbed as *X*, or Critic's *Quill*, 7. 1.
 And nipping as the *Tongue*, 9.
 From Thee Instruction we instil,
 And Warning of our Wrongs !
 6. True as the *Needle*, if to Thee 3.
 Our ev'ry Action tend ;
 The Christian, Friend, and Critic, see,
 Are happy in the End.

ON INSINCERITY, and the CROSSES* of Friendship. By Miss Polly Stow.

* 7th Ænigma.

Rara Avis in Terris, nigroque similis Cygna.

I.

WHERE is the true disinterested Friend,
 Inclined to serve you, without private End ?
 Acquaintance num'rous are found ev'ry where,
 But a true Friend is, like the Phoenix, rare !

II.

Friendship is of brittle Kind,
 And, when broken, seldom join'd ;
 But the Flaw will still appear ;
 China broke, though join'd with Skill,
 Be the Cement what it will,
 Never can ring sound and clear.

The Ænigmas were ingeniously answered, in Verse, by a Highland Gentleman ; also by Mr. John Broadbent, of Saddleworth, Yorkshire ; Mr. Giles Lacey, of Bridport ; Mr. Stephen Hartley, of Sowerby-Bridge ; Mr. James Muscroft, of Roiberham, Yorkshire ; a Gentleman, who signs Knowlitt, answered the Prize ; Mr. Robert Arnold, of Brinsworth, near Roiberham, answered most of the Ænigmas ; Mr. Stuckfield, humourously, most of the Ænigmas ; Mr. J. Bailey, all, in Verse ; Mr. William Swift, of Stow, on Disappointment, all ; Mr. John Lynn, of Ruffe, Northumberland, who proposed some new Ænigmas and Rebuses, we had not Room for. Mr. John Wigley, of Berington, answered most of the Ænigmas in Verse, and proposed a new Ænigma, on King Asa, reading the same backward as forward, which we are forced to omit, having already too many of that Sort this Year. Elizabeth Gr--nt answered them, and proposed a new Rebus we have not Room to insert. Mrs. Margaret Gr--nt, answered the same ; as did Titus Vespasian, and a Drummer ; Messrs Goodlad and Harland in Verification ; J. B. L. and W. Sedgwick, of Cottesham Free-School ; Mr. Richard Judson, of Boverly, in Verification, all ; Mr. Joseph Cowley, of Mr. Shaw's School, Chesterfield, Derbyshire, most ; Mr. J. H. of Lewes, Sussex ; and Mr. James Potts, Teacher of Languages and Mathematics, at Bedlington, Northumberland.

All the ÆNIGMAS answered by Mrs. Margaret Gr--nt.

Arrow, Crackers, Level, Nut, Abba, and Beauty bright,
 The Letter *X*, Compass-Needle, Tongue, and Churn, bring all to Light.

Mr. Alexander Rowe, of Cornwall, answers the ÆNIGMAS thus.

Pluma, Libella, Forceps, et Nucifrangibula ; 1. 4. 9. 2.
 Venuslas, Cruz, Nux, Vates, cum Pyxide nautica. 3. 7. 5. 6. 8.

Mr. Swift's Catalogue of Authors, though poetically and inimitably described, is not sorted for Company with each other ; Barrow does not sort with Partridge,

Partridge, the Almanac-Maker, nor Homer with *Humb* and *Kettlewell*; and therefore we omit the Inscription.

An Answer to all the ENIGMAS, in a Morning SOLILOQUY. By Mr. Hume

Gumley, of Countesthorpe, Leicestershire.

NOW rasy Morn had op'd the Gates of Light,
And chas'd away the Phantom of the Night;
The tuneful Birds awake to hail the Day,
And pearly Dew-Drops ornament the Spray.
The Flowers expand, and with fresh Beauty shine, 7. 3.
And to the Breeze their Fragrancy resign;
The dazeling Sun peeps o'er the Eastern Hills,
And sees his Face reflected by the Rills;
With ardent Zeal he climbs the azure Skies,
And bids the Sluggard from his Bed arise.
The rustic Tribes o'erspread the Level Plains, 4.
(Indulgent Nymphs and truly honest Swains,)
To mow the Grass, and turn the dulcet Hay,
And, in hard Labour, spend the coming Day.
Contentment's theirs, though void of shining Wealth,
And ev'ry Face is crimson'd o'er with Health.
See youthful Anna, cheerful as the Day, 6.
Round whom ten Thousand Thousand Graces play;
Health paints her Cheeks with all its lovely Dye,
And true Good-Nature sparkles in her Eye!
What though no rustling Silks the Maid adorns,
Nor Gold, nor Gems, from distant Regions borne?
She's far more happy, far more blest than they,
Who madly squander all their Time away
In pompous Balls, and courtly Masquerades,
Luxurious Feasts, and Mirth that quickly fades;
At Home the Churn-Dash lustily she wields, Prime.
Or with her Rake on Compasses the Fields; 8.
Fields, where the gentle cooling Breezes blow,
And Nuts and wild Fruits in Profusion grow; 5.
Where hostile Armies, blacken'd o'er with Rage,
With Swords and Bucklers* never now engage. 1.
There from the Teazing Throng I oft retire, 9. Tea-Tongs.
Who nought but Noise and turbid Scenes admire;
There taste the Fragrance of the balmy Breeze,
That waves the Flow'rs, and breathes among the Trees.
Ere from his Bed bright Phœbus doth arise,
When sweet Aurora tinges o'er the Skies,
Have I walk'd there, in thoughtful Mood along,
And heard the Lark begin his early Song.
There too, when Noon dries up the tender Flow'rs,
And Light and Heat in great Profusion show'rs,
I oft recline beneath the cooling Shade,
By brushy Elms and oaken Branches made.
There too, I oft repair, at sober Eve,
And, for the Fields, the noisy Village leave.
In ev'ry Season, how amaz'd am I!
New Wonders rise, fresh Beauties strike the Eye!

* Alluding to the Plume of Feathers thereof.

The Heav'ns, the Waters, and the verdant Sod,
 And ev'ry Thing around, proclaim a God!
 A God beneficent, a God most wise,
 Who loves his Creatures, and their Wants supplies.
 Let thoughtless Worldlings love the noisy Town,
 And lose their Peace to come at high Renown;
 To Wealth and Honour their Devotion pay,
 And smiling Pleasure's guileful Lures obey;
 From such vain Joys, O God, divert my Mind,
 And let me be to meditate inclin'd;
 Illume my Soul with one celestial Ray,
 And I'll to Thee my sole Devotion pay.

All the ENIGMAS answered by the Rev. Thomas Vaughan, M. A. at Morpeth, Northumberland.

LYSANDER lamenting the Departure of ANNA. *An ODE.*

1. SILENT as yielding Maids consent,
 With Love and Care oppress'd,
 Lysander to his Anna went, 6.
 As Troilus to his Cress'd.
*The Time was come, she must depart,
 He, struck with Anguish, Pain, and Smart,
 Did thus unfold his panting Heart,
 In broken Tones distress'd.*
2. Should Jove set me in Atlas' Place,
 And lay Heaven's Weight upon me,
 Such Crosses would not me depress, 7. *Alluding to X.*
 So much as parting from thee!
*By that sweet Face, that Form divine,
 And Breasts that do my Soul enshrine,
 Ease, Pleasure, all, I must resign,
 If Fate such Hardships doom me.*
3. Ye Powers! what does your Rage provoke,
 My Love from me to sever?
 This sad, surprising, fatal, Stroke
 Does blast my Hopes for ever.
*'Tis like the Circling of the Sun,
 When parting from the frigid Zone,
 And I in Greenland left alone,
 In dark Despair to wither.*
4. Like Atho's Hares, or Hybla's Bees,
 Admirers flock'd to move her!
 Till Perseverance, by Degrees,
 Made me the happy Lover.
*One Nut-Crack Night I trip'd along, 5. 2.
 Gazing with the adoring Throng,
 (She'd churning been,) her charming Tongue
 Would make a Saint turn Rover. Prisc.*
5. Love level'd Ensigns at my Breast, 4.
 And in his Train did list me;
 Then with her Love did me invest;
 What Pow'r could then resist me?
*Who would withstand, or disapprove,
 Thy Will and Pleasure, mighty Love!
 I would not change my Place with Jove,
 While she with Love carest me.*

6. It would convert an Infidel,
 Turn Saints from Superstition,
 Make ev'ry Hermit run to Hell,
 Change Prayers into Ambition,
And raise an Anch'rite from his Grave,
One pleasant Look from her to have,
Her Frowns can kill, her Smiles can save,
Beyond the best Physician.
7. When, in her Face, a civil War
 Bursts out in am'rous Flashes,
 And when the white and red Rose jar,
 'Twixt Fortitude and Blushes,
Stout Heroes 'tis enough to kill;
But, when the Armies both stand still,
Thrice happy he, who, at his Will,
Into the Pillage rushes.
8. Upon her Breasts two Hills advance,
 Inviting Hearts for ever;
 Where all the Nymphs and Graces dance,
 And Love reclines his Quiver. 1. Feathered.
The Curtain's drawn on what's below,
Astrology can never show
The Thing that I could wish to know;
But Rev'rence curbs Endeavour.
9. But oh! how sweet's a Soul enshrin'd
 In this celestial Creature!
 An Angel's Face, a virtuous Mind,
 The utmost Stage of Nature!
The other Day, when we drank Tea,
No Tongue we us'd — the Sugar she
With Fingers help'd like Ivory,
No Goddess's were brighter.
10. Such Paradises of Delight!
 Shall Fate from me unhand them?
 Where Wit and Beauty do unite! 3.
 What Rebel can withstand them?
My choicest Bliss I'll not forego,
Though Fortune frown, and Friends say no;
Our Loves are's Needle fix'd, and so 3.
There's None shall countermand them.

All the ENIGMAS answered by Mr. J. Bayley, of Middleton, Yorkshire.

- A Beauty dwells in our Town, 3.
 Her Colour is of the Nut Brown; 5.
 The Toast of all her darling Sex,
 Her Name ends with the Letter X. 7.
 To Bus'ness she knows what belongs,
 Can handle Needle, Churn, or Tong. 8. Prize. 9.
 Her Father is possess'd of clear 6.
 Three Times five Hundred Pounds a Year:
 And, as Cracks go, she will be found 2.
 A Fortune good as any round.
 — But in a Whisper I'll impart,
 Cupid has level'd so his Dart, 4. 1.
 That she is Mistress of my Heart, }

The PRIZE-ÆNIGMA answered by the Rev. Thomas Vaughan, of Mospeth, Northumberland.

YOUR Cburn, O Sadler, does produce
A Thing of universal Use ;
While Saphy's Hand-Dash Butter makes,
She of the pleasing Toil partakes,
Now, if I've made the Riddle clear,
I hope to get a Prize next Year.

The PRIZE-ÆNIGMA answered by Miss Polly Stow.
I for the Prize will take my Turn,
The well-wrought Subject is a Cburn.

The School-Boy's Morning Exercise. On Dr. LEVEL's SUDORIFIC. By the Palladium-Author, junior.

- * *He levels all, both great and small. 4th Ænigma.*
1. O' th' Faculty, ONE, wise and grave,
Call'd to a Patient's Preservation,
Declar'd that he his Life could save
Only by raising *Perpiration*.
 2. Prescription on Prescription's tried,
To put the Patient in a Sweat ;
The stubborn Case Relief denied,
And did the Doctor's Skill defeat.
 3. The Patient, driven to Despair,
Said, Doctor, let me have your Bill,
And you'll soon see what Hopes there are —
If that don't sweat me, Nothing will !

ANSWERS to the QUERIES in last Year's PALLADIUM.

I. QUERY 222, answered by Mr. Alexander Rowe, of Cornwall.

ANY where, on the Sea, under the Equinoctial, or at the Equator ; for there the Power of Gravity is less than at the Poles, where the Diameter of the Earth's oblate spheroidal Figure is the shortest, and consequently Attraction greatest.

Mr. George Hicks, of Reedness, says, that a Ship will have the least Pressure upon the Water at the Equator, and the greatest at either of the Poles ; occasioned by the Earth's diurnal Motion, and the Diminution of the Earth's centrifugal Force at the Poles.

II. QUERY 223, answered by Mrs. Margaret Groot.

MOST of the Churches were first built due East and West ; which granted, and the present Declination being given, (they declining a Degree in 70 Years,) the Time of their being first built is thence easily and readily determined.

III. QUERY 224, answered by Medicus.

WHEN Men lived to a greater Age in antient Times, the Time of a Woman's Pregnancy (to perfect a more durable Birth) might be greater than at present, 9 Months. Some Children have been born at the End of 7 or 8 Months in England, but seldom lived long, or not so long as those born at their full Time. However, 9 Calendar Months, of 30½ Days each, making about 275 Days, are not much unequal to 10 Months of 28 Days each, making 280 Days ; so that a Difference of near a Month, in the Time of reckoning a Woman's

Woman's *Pregnancy*, will arise from the *different* Way of reckoning the Time of 1 Month; from whence the *Mistake* of a Month in the Time of *Pregnancy*, (10 for 9 Months,) by *Leucyrides*, might proceed.

Most *Animals* (except Mankind) have stated *Seasons* for Procreation. The Females go with Young, some a longer, some a shorter, Time. *Mares* go from 11 to 12 Months; *Cows* and *Hinds* go 9 Months, the same as Women; *Foxes* and *Wolves* 5 Months; *Bitches* go only 7 Weeks; *Cats*, 9 Weeks; and *Rabbits* 31 Days. Most *Birds* are hatched in 21 Days; the *Canary-Birds*, and some others, are hatched in 13 or 14 Days. Hence there appears to be an endless Variety in the Time, as well as in the Manner, of the Generation of *Animals*.

IV. QUERE 225, answered by Grammarians.

THE Term, *equivocal*, denotes literally a doubtful or double Meaning, and must denote the same when applied to Generation; making a doubtful Kind of Generation. Whereas *spontaneous* signifies voluntary, of its own Accord, without Compulsion; making *spontaneous* Generation to signify the Production of *Animals* and *Plants*, without the Cause of *Sexes* and *Semen*; and therefore *equivocal* and *spontaneous* Generation imply differently; and consequently *equivocal*, or doubtful, is improperly substituted for *spontaneous*, or self-caused, of its own Accord:

ANSWERS to the REBUSES in last Year's PALLADIUM.

I. DARTMOUTH-Town.

III. WALLINGTON-Town.

II. A philosophical TRAVELLER, or
Legerdemain JUGLER.

IV. EMERSON.

V. WESTRAM-Town.

I. REBUS answered by Mr. Isaac Gumley, of Countesthorpe, Leicestershire.
WITH my Hand, O Friend Lacey, I'll readily greet you,
If ever at Dartmouth I happen to meet you.

I, and IV. REBUS answered by Mr. I. Stuckfield, of Stepney.

THE Mouth,* more fell than Cupid's Dart, 1. Dartmouth,
A pois'nous Rancour may impart; * Backbiting.
The libelling Tribe,† without Dispute, † Private Libellers.
May find a Fable that will suit,
If they the Mastiff-Dog apply,
Or else the Coach-Wheel and the Fly.
They'll see the Moral does explain
A feeble or distemper'd Brain. —
Then let them snarl — they cannot bite —
But, like Assassins in the Night,
They, when bright Sol his Beams displays, 4. Alluding to an
To their known Holes will sneak their Ways. eminent Harbor.

Mr. I. Scott, of Cawthorne, answered 1. 3. 4. Mr. Stephen Hartley, 1. 2.
3. 4. 5. Mr. William Swift, 1. 5. Mr. Knowlitt, 1. Mr. William Oliver, 1. 4. Gemini, and Mr. Widdrington Bourne, of Morpeth, 1. 2. 3. 4. 5.
I. B. L. and W. Sedgwick, of Cottingham School, 1. 2. 3. 4. who say the first has been often proposed and solved. Mr. Alexander Rowe, 1. 2. 3. 4. 5.
Miss Sally Hill, of Hill, near Gibside, Newcastle, 1. 3. 5. Mr. James Potts, of Bedlington, Northumberland, all. Mr. Dalton, all.

Mr. William Swift, of Stow, answers the 2d R^{EE}US thus.

SAGE Merlin* and Hector are quite out of Date,

'Tis Pegasus Royal that now wins the Plate.

* Alluding to a philosophical Traveller, or Juggler, with a Budget.

II. R^{EE}US answered by Martinus Merlinus.

OF Longitude I take no Part in,

Because 'tis known to be uncertain.

Let th' Man o' th' Moon, among the Witches,

Be mask'd, and wear his little Breeches ;

His Sibyl-Oracles intrude,

And Libels print for Longitude :

Let necromantic Observators

Be his Assistant Operators,

Hight Whacum and Sir Sydropbel ! †

Who, by the Stars, so much can tell !

Bring Sopby, with her Hat and Feather,

And Yea and Nay, and all together !

† Alluding to Travellers, or Legerdemain Jugglers.

ANSWERS to the PARADOXES in last Year's PALLADIUM.

I. PARADOX answered by Mr. Dalton, of Pool.

ANY two Places on the Globe, (not lying under the *Equinoctial*,) having *Latitude*, will have the Property mentioned. For though the Port B bears, by the *Compass*, due *West* from the Port A, yet a *Ship*, steering continually due *West* from A, cannot arrive at B ; because, (not sailing on the *Equator*,) in sailing from any Place directly to another, the Course or Bearing by the *Compass* continually alters ; and therefore, sailing on the *same Course* with the first Bearing will never carry a *Ship* to that Place.

Mr. I. H. of Lewes, *Sussex*, answered it ; as did Mr. Alexander Rowe,

II. PARADOX answered by Philo-Sophia.

MICHAEL MAN, Esq. married a *Lady*, who was a *Clergyman's Daughter*, making her *Name* the same with his own. — N. B. He had Issue by her one Son and two Daughters.

The same answered by Mr. Isaac Gumley, of Countesthorpe, *Leicestershire*,
To the Proposer.

If Man is your Name, then your Wife is a Man ;

So do what you can,

As you say you began,

And let it be seen that you're truly a Man.

Mr. Giles Lacey, of *Bridport*, answered this Paradox in a similar Manner. Mr. I. Scott, of *Carwotborn*, answered it ; as did Mr. Stephen Hartley ; Mr. Knowlitt, (who so signs, the Post-Mark *Ettering*) ; Mr. I. Bayley, of *Middleton*, *Yorkshire* ; Mrs. Margaret Gr--t ; the Rev. Thomas Vaughan, of *Morpeth* ; Mr. Hartley, of *Sowerby-Bridge* ; J. B. L. and Sedgwick, in *Cottingham Free-School* ; Mr. J. H. of *Lewes, Sussex* ; and Mr. James Potts, of *Bedlington*, *Northumberland*.

Mr. Richard Dalton, of *Pool*, informs us, that the *Palladium* and *Royal Astronomer* are both well received in his Part of the Country, and are encouraged by many Gentlemen of Ingenuity,

ANSWERS to the QUESTIONS in last Year's PALLADIUM.

*The Art of Numbers is for ever new,
And leads to Truth through Pleasure's Avenue;
Its Reasoning just, by Demonstration's Rules,
The Guide and Glory of our British Schools!
Improves the Mind, embellishes the Man,
And makes him what no other Science can.*

I. QUESTION 450, answered by Mr. Richard Dalton, of Pool.

LET a and b = given Numbers, respectively, in the first and second Equations. Then, from the 2d Equation, $\sqrt{y} = \frac{x^4}{b-x^3}$; which being put in the first, $x^2 \times \frac{x^4}{b-x^3} + x^3 - \frac{x^4}{b-x^3} = a$, = 29030401312. Solved by Trial and Error, or the Rule of False, $x = 22$ = Years, the Lady's Age; and, consequently, $y = 7744$ l. her Fortune; required.

Mr. George Coughron, of Newcastle, elegantly solved it, by the same Equation. Who has otherwise solved it by a new Improvement of his, as follows.

From the 2d Equation it appears, that x must be less than $\sqrt[3]{13310\frac{1}{2}}$; and therefore cannot exceed 23; consequently, from the 1st Equation, y cannot be less than $\sqrt{29030401312}$; and therefore must be greater than 7400; but, by the 2d Equation, it is evidently a square Number: And, by trying, the square Numbers above 7400, $y = 7744$ l. is found to succeed, being the Lady's Fortune; and thence $x = 22$ Years, her Age. W. W. R.

Mr. James Bean Lee, and Mr. William Sedwick, at Cottingham Free-School, near Hull, solved it by a Method similar to Mr. Dalton's; as did Mr. Richard Judson, of Beverly, Yorkshire; Mr. George Grant, Pupil to Mr. Judson; Mr. Joseph Cowley, of Mr. James Shaw's School, at Chesterfield, Derbyshire; Mr. William Hays, of Frodsham, Cheshire; Mr. James Muscroft, of Rotherham, Yorkshire; Mr. Robert Arnold, junior, of Brinsworth, near Rotherham; Mr. James Lamb, Schoolmaster, at Aldbrough, near Hull; Mr. Robinson, of Bid-dick; Mr. John Shadgett, of Ross, Herefordshire; Mr. Charles Burton, of Brest-by, Derbyshire; Mr. Michael Taylor, of Marley-Hill, near Newcastle upon Tyne; Mr. Thomas Goodlad and Levi Harland, Pupils at Cottingham Free-School; Mr. Ezekiel Walker, of Stapenhill, Derbyshire; Mr. Alexander Rowe, of Reginnis, Cornwall; Mr. I. H. of Lewes, Sussex; which last Gentleman observes, that x cannot be above 23, by the 2d Equation; and making a second Trial, by supposing $x = 22$, x^4 will divide by $b - x^3$, without a Remainder; which is the square Root of y , per Question: Whence $y = 7744$. Mr. Lynn, late a Pit-man, but now a Teacher of School-Accomplishments to British Youth, at Bolam, Northumberland, puts a and b for the Numbers in the 1st and 2d Equations,

and finds $y = \frac{x^8}{b-x^3}^2$, which he puts in the 2d Equation, and gets, after

Reduction, $x^{11} + x^{10} - 2bx^8 + x^8 + b^2 + x^6 + 2bax^3 = ab^2$; whence, he finds $x = 22$, and y as before, Gemini, and also, Mr. Widdrington Bourne.

of Morpetb, and Mr. John Broadbent, of Saddlesworth, *Yorksire*, solved it, by finding x from the 2d Equation, after putting the Value of y therein, in Terms of x , from the 1st Equation.

II. QUESTION 451, answered by Mr. James Nicholson, *Mathematical Teacher*, at Stanton, *Northumberland*.

PUT $s = 10s$. $r =$ given Ratio $= \frac{100-5}{100} = \frac{95}{100} = \frac{19}{20}$, (being the

Ratio of 20 Sixpences spent on the 1st Day, to 19 spent on the 2d.) Then, by

Lemma 2, P. 74, *Pall.* 1772, $\frac{a}{1-r} = 10l$. spent in all, were he to live and

spend at that Rate for ever. W. W. R.

Mr. Judson, of Beverly, solved it in the very same Manner; as did Mr. George Coughron, of Newcastle; Mr. John Scott, of Carwborne, *Yorksire*; Mr. Robert Arnold, junior, of Brinsworth, near Rotherham; Mr. Stephen Hartley, of Sowerby-Bridge; Mr. James Lamb, School-Master, of Aldborough, near Hull; Mr. James Bean Lee, of Cottingham Free-School; which last Gentleman observes, that if the Person were to spend on till he spent on the last Day 1 Farthing, the least English Coin, that his Expenses would amount, in all, to 9l. 19s. 7d. $\frac{1}{2}$; being but 4d. $\frac{1}{2}$ short of his spending for ever at that Rate. — Gemini, of Morpetb, answered it; as did Mr. James Muscroft, of Rotherham; Mr. Samuel Smith, of Pakefield, near Lothess, *Suffolk*; Mr. Michael Taylor, of Marley-Hill; Mr. W. Wilson, of Norwich; Mr. James Potts, Teacher of Languages and Mathematics, at Bedlington, *Northumberland*.

Remark. Several other Correspondents supposed, that 20 Sixpences were spent on the 1st Day, 19 on the second, 18 on the 3d, &c. to 1 Sixpence on the last Day; in a decreasing arithmetical Progression of 20 Terms, (without taking into Consideration the Conditions of the Question of 5 per Cent. spent every Day less than on the former, after 10s. spent on the first,) whereby they determine

the Sum of an arithmetical Progression $= \frac{20 + 1 \times 2}{2} = 210$ Sixpences, or 10s

8billings; being 5 Guineas spent, instead of 10l. (the Sum of the infinitely-decreasing geometrical Progression,) the true Answer.

A short RULE for summing an infinitely-decreasing geometrical Progression, universally.

Divide the Square of the first Term by the Difference of the first and second Terms, and the Quotient will be the true Answer. For, by the Lemma, P. 74,

Pall. 1772, the Sum $= \frac{a}{1-r} = \frac{a}{1-\frac{c}{a}}$, (c being the second Term, and r ,

the Ratio, $= \frac{c}{a}$.) which reduces to $\frac{aa}{a-c}$, the Rule. — *Pal. Author*.

III. QUESTION 252, answered by the Palladium-Author.

BY the common Rule, (see *Pall.* 1771. P. 37,) the Product, divided by the Difference of the Times of Revolution, of two Hands, (setting out together and moving the same Way,) will give the exact Time of their next Conjunction; consequently the Half of that Time will be the exact Time of their next Opposition.

Hence,

Hence, $\frac{1^b \frac{2}{3} \times 1^b \frac{1}{2}}{1^b \frac{2}{3} - 1^b \frac{1}{2}} = \frac{1}{6} \frac{15}{6} (= 15 \text{ Hours, the Quotient, when both}$

Hands are next together, or in *Conjunction*. Consequently they will be next in *Opposition*, or *Half* a Revolution asunder, in the *Half* of that Time, or $7\frac{1}{2}$ Hours, from the Time of their setting out together and moving the *same Way*. But moving the *contrary Way*, when they first set out together.

Put $a = 1^b \frac{2}{3}$, the Time of the *slowest* Hand, A, making 1 Revolution; and $b = 1^b \frac{1}{2}$, the Time of the *swiftest* Hand, B, making 1 Revolution.

Then, As $a : 1 :: b : \frac{b}{a}$ Revolution, made by A, in b Time, while B makes 1 Revolution, in the same Time. Consequently, moving together, the *contrary Way*, they make $\frac{b}{a} + 1 = \frac{b+a}{a}$ Revolutions, in the same Time, b ,

Now, as $\frac{b+a}{a}$ Revolutions : b Time :: 1 Revolution : $\frac{ba}{b+a} =$ Product divided by the Sum of the Times of Revolutions of two Hands, or Bodies, moving the *contrary Way*, when they are next conjoined, $= \frac{1^b \frac{1}{2} \times 1^b \frac{2}{3}}{1^b \frac{1}{2} + 1^b \frac{2}{3}}$ equal to

$\frac{29}{6} \frac{15}{6} (= \frac{15}{19} \text{ Hour} = 47^m \frac{7}{19}$, the Time, required.

Remark. The Times of Revolutions, $1^b \frac{2}{3}$ and $1^b \frac{1}{2} = \frac{5}{3}$ and $\frac{3}{2} = \frac{15}{6}$

and $\frac{15}{10}$, reduced to the same Numerator, in lowest Terms, shew that 15 Hours

is the Time of next *Conjunction* of the Hands moving the same Way; and the respective Revolutions performed $=$ to their Denominators, 9 and 10; hence

the Half of $15^b = 7^b \frac{1}{2}$, and $4\frac{1}{2}$ and 5, (the $\frac{1}{2}$ of the Revolutions,) the Number of Revolutions performed by each Hand. See P. 36, *Pal.* 1771.

Mr. George Coughron solves this Question as follows.

PUT a and b for $1\frac{1}{2}$ and $1\frac{2}{3}$, the respective Times of Revolution; then, as

T. T.
 $b : a : 1 \text{ (Revol.)} : \frac{a}{b} =$ the Part of a Revolution, performed by the *slowest*

Hand, in the Time a ; whence, $1 \pm \frac{a}{b} = \frac{b \pm a}{b} =$ Sum and Difference of the Parts of a Revolution passed over by the Hands in the same Time a , moving the *contrary* and *same Way*, respectively. Therefore, as $\frac{b-a}{b}$ Revolution

$\frac{1}{2}$ Revolution :: a Time : $\frac{\frac{1}{2}ab}{b-a}$ Time = $7\frac{1}{2}$ Hours, the Time after setting out, at which the Hands will be *opposite*, both moving the *same Way*. And as

$\frac{a+b}{b}$ Revolution : 1 Revolution :: a Time : $\frac{ab}{a+b}$ Time = $47^m 22^s \frac{2}{19}$,

when the Hands will next be in Conjunction, moving the *contrary Way*; agreeing with the *former Solution*.

Mr. Alexander Rowe solved this Question in the *same Manner*; as did Mr. Ezekiel Walker, of Stapenhill, Derbyshire; Mr. Samuel Smith, of Pakefield, Suffolk; Mr. Joseph Dunkin, at Mr. William Pearson's School, Northfields; Mr. Robinson, of Biddick; Mr. James Nicholson, at Stanton, Northumberland; Mr. J. H. of Lewes, Suffex; Mr. John Ruffle, of Bolam, Northumberland; Gemini, of Morpeth; Mr. W. Wilson, of Norwich; James Bean Lee and Mr. W. Sedgwick, of Cottingham Free-School; Mr. W. Hayes, of Frodsham, Cheshire; Mr. John Shadgett, of Rofs; Mr. Stephen Hartley, of Sewerby-Bridge; Mr. Michael Taylor, of Marley-hill, Newcastle; and Mr. James Potts, of Bedlington, Northumberland.

IV. QUESTION 453, answered by Mr. George Coughron, of Newcastle upon Tyne.

PUT a, b, c , for 1730, 1466, and 59; then, from the 1st Equation,

$x^{\frac{1}{2}} = a - y^{\frac{1}{2}}$; which wrote for it, in the other two Equations, gives

$y^{\frac{1}{2}} + x \times a - yx^{\frac{1}{2}} = b$, and $x^{\frac{1}{2}} + y^{\frac{1}{2}} \times a - yx^{\frac{1}{2}} = c$; from which Equations, by Trial and Error, $y = 64$, $x = 729$, and $z = 4$.

N. B. This Question is also in the Gentleman's Diary for 1771, proposed by the same Mr. Robinson. — Why so?

Mr. Ezekiel Walker, of Stapenhill, Derbyshire, correcting the Data, answers thus. — Put $a = \sqrt{x}$, $c = \sqrt{y}$, $u = \sqrt{z}$, $b = 1730$, $c = 1466$, and $d = 59$, not 49, as printed.

He then gets, from the given Equations,

$$\begin{array}{ll} 1 & a + eu = b. \\ 2 & c + uua = c. \\ 3 & u + aac = d. \\ 4 & u - uua = c - c - uua. \\ 4 \text{ sub. } 3 & 5 \quad u + aac - a^2u^2 = d. \\ 4 \text{ sub. } 1 & 6 \quad a + c - uua)^2 \times u = b. \end{array}$$

$$5 \pm \quad u - \frac{u}{a^2} = \frac{a^2c - d}{a^3}. \quad \text{Sub. } u = \frac{r}{a^2} \text{ and comp. Sq.}$$

$$\text{Hence } 8 \quad u = \sqrt{\frac{a^2c - d}{a^3} + \frac{u}{4}} + \frac{u}{2} = B \text{ for } u \text{ in the}$$

6 write B 9 $a + c - B^2a)^2 \times B = 1730$, solved by double Position, $a = 2$, Th. $x = 4$, $y = 64$, and $z = 729$, the Numbers sought.

Mr. Robinson, the Proposer, corrects $d = 59$, for 49 printed; and, proceeding through a Process of 17 regular Steps, comes to a final Equation of 3 Radicals, besides compound Quantities; which resolved, by Trial and Error, he finds the required Numbers, 4, 64, and 729.

Mr.

Mr. *Alexander Rowe*, by a *similar Substitution* to Mr. *Enoch Walker's*, (correcting 49 to 59,) goes through a *short Process* of 6 written Lines, and comes to this *Conclusion*: $a^3 - 14.75a^2 + 54.390625a = 22.78125$; whence he finds $a = 2$; thence u (substituted for $\sqrt{u}$) = 27; and consequently $x = 4$, $y = 64$, and $z = 729$, required.

Mr. *Richard Dalton*, of *Pool*, gives a *short Process* and true *Conclusions*. Mr. *John Lynn*, of *Ruffe, Northumberland*, shortly answered the same, giving the *Correction*. *Gemini*, of *Morpeth*, gave an *analytical Solution* without Numbers. Mr. *Michael Taylor*, of *Marley-hill*, gave a *Process* and Numbers true; as did Mr. *J. H.* of *Lewes, Sussex*; Mr. *Joseph Cowley*, of Mr. *James Snow's School, Chesterfield, Derbyshire*; and Mr. *John Shadgett*.

V. QUESTION 454, answered by Mr. George Coughron.

PUT x for the first Number, and y for the second; then will the third be

$\frac{a}{xy}$; and, by Question, $x : \frac{a}{xy} :: y - x : \frac{a}{xy} - y$; and $b + x : c - y :: c - y$

$: \frac{a}{dy}$; from which Proportions we get, by multiplying Extremes and Means,

$2ax - x^2y^2 = ay$, and $a \times \overline{b+x} = dxy \times \overline{c-y}^2$; from the former, $x = \frac{a}{y^2} \pm \frac{a}{y^2} \sqrt{1 - \frac{y^3}{a}} = \frac{ab}{dy \times \overline{c-y}^2 - a}$ by the latter; Whence y may be found, and thence the Rest. W. W. R.

Mr. *Stephen Hartley* answered the same; as did Mr. *Robert Arnold*, junior; Mr. *James Muscroft*; Mr. *George Hicks*; Mr. *J. H.* of *Lewes*; Mr. *Michael Taylor*; Mr. *George Grant*, Pupil to Mr. *Judson*; *Gemini*, of *Morpeth*; Mr. *Judson*, of *Beverley*, who makes this Observation by Way of Corollary. If Half the Sum of the Extremes ($= s$) and the Product of the 3 Numbers ($= a$), in any harmonic Proportion, be given, the Numbers themselves will be

$s + \sqrt{s^2 - \sqrt{as}}$, $\sqrt{\frac{a}{s}}$, and $s - \sqrt{s^2 - \sqrt{as}}$, universally.

Mr. *Richard Dalton* solved it; also Mr. *Alexander Rowe*, Mr. *Robinson*, and Mr. *Lynn*, of *Ruffe*.

VI. QUESTION 455, answered by Mr. John Shadgett, of *Ross, Herefordshire*.

PUT $a = 7854$, $c =$ the Content of the *Pail* in cubic Inches, and $x =$ the inside Diameter: Then, $ax^2 =$ Area of the Base; $4ax =$ the Circumference of the Base; $\frac{c}{ax^2} =$ Depth of the *Pail*; $4ax \times \frac{c}{ax^2} = \frac{4c}{x} =$ con-

cave Surface; and $ax^2 + \frac{4c}{x} =$ whole inside Surface, which must be a Minimum by the Question.

In Fluxions, $2axx' - \frac{4cx'}{x^2} = 0$. Whence $x = \sqrt[3]{\frac{2c}{a}} = 12.084372$,

and the Depth $\frac{c}{ax^2} = 6.042136$, if c be put = the Content in Wine Measure;

sure; but if it stands for *Alt Measure*, $x = 12,91526$, and the Depth = 6.45763. W. W. R.

Mr. George Coughron answers it thus.

By *Simpson's Fluxions*, Art. 31, the Altitude = $\sqrt[3]{\frac{3 \times 282}{3.1416}} = 6.45763$,

&c. and the Diameter, the Double thereof, = 12.91526, &c. Inches. That is, supposing the Thickness of the Wood of the Pail to be inconsiderable. But, if the Wood be of a given Thickness, it should be taken into Consideration, and the Conclusion in that Case will be different.

Mr. Michael Taylor, of Marley, makes the same Observations, after answering in the above Manner. For, the Thickness of the Wood of the Pail being considered, the Difference between the internal and external Solidities of the Pail will be the Minimum, or Pail itself.

This, it seems, is exemplified in Solution to 62 Ladies Diary Quest. Hutton's Genl. and Ladies Miscellany.

Mr. William Pearson, of Northfields, by an elegant Process, finds the Pail's Diameter = 12.9153, &c. and its Altitude = 6.45767, &c. Inches. Who says that this Question may be seen in several Books of Fluxions. [Why then sent to the Palladium?]

Mr. Samuel Smith, of Pakefield, near Loosloff, Suffolk, answered the same in the same Manner; as did Mr. Robinson, of Biddick. Mr. Alexander Rowe,

from Pal. 1770. P. 44, gives this Rule; $\sqrt[3]{\frac{2 \times 3 \times 282}{.7854}} = 12.91526$, &c.

Inches = Diameter; and thence (dividing by 2) 6.45763, &c. Inches, the Pail's Depth, are the Dimensions required: confirming the above Solutions. Mr. Richard Dalton, of Pool, confirms the same Truth; whose Solutions are, in general, elegantly performed. Mr. Richard Judson, from Quest. 384, P. 44, Pal. 1770, (being similar,) finds the same Dimensions; Mr. Lynn does the same by a short Process; as does Gemini, of Morpeth; and Mr. George Grant, Pupil to Mr. Judson. Mr. W. Hedley, of Northumberland, solved it by a neat Process without Numbers. Mr. W. Wilson, of Norwich, solved it analytically and numerically; as did Mr. J. H. of Lewes; Mr. J. Scott, of Cowthorne; Mr. J. B. Lee and W. Sedwick; Mr. John Broadbent, of Saddleworth, Yorkshire; who refers to Fletcher's Universal Measurer and Mechanic, Qu. 40, P. 136, Part 3. He informs us of the Palladium Questions being wrong numbered, which is now corrected in the Answers. It was also solved by Mr. Joseph Cowley, of Chesterfield, Derbyshire; Mr. W. Hayes, of Frodham, Cheshire; Mr. Stephen Hartley; and Mr. James Potts, of Bedlington.

Mr. Charles Taylor's Solution to this Question (who is Pupil to Mr. Brownell of Coventry) is correct; as are his Solutions in general.

VII. QUESTION 456, (marked VI. 455, the second,) answered by Mr. George Coughron.

PUT v^2 and w^2 for $x+y$ and xy , respectively, and the given Equations will become $v^2 + w^2 = a^2$ and $v^4 - 2w^2 = b$; from the first of which, $w^6 =$

$\frac{a^3 - b^3}{3} \div \frac{a^2 - b^2}{2}$ by the 2d Equation; from which w may be determined, (but not by a Quadratic,) and thence v is had, &c.

Mr.

Mr. Alexander Rowe's Solution.

PUT $x+y=v^2$, and $xy=u^2$; then, from the given Equations, we have

$v^2+u^2=a$, and $v^4-2u^2=b$; therefore, $u^2=\frac{v^4-b}{2}$, and $u=$

$\sqrt{\frac{v^4-b}{2}}$; these Values put for those in the first, we get $v^2+\frac{v^4-b}{2}$,

$\sqrt{\frac{v^4-b}{2}}=a$; which, solved by *Trial and Error*, gives the Value of v ;

thence we obtain that of u ; and consequently those of x and y ; when a and b are known.

N. B. In many Cases the last Equation will reduce so as to be resolved by a *simple Equation*. *Quere.*

Gemini, of *Morpeth*, substitutes in the same Manner, and finds the same *Conclusions* as *Mr. Congbren* and *Mr. Rowe*. *Mr. Robinson*, of *Biddick*, puts $xy=mx$,

$x+1=m$, $my=x+y$, ($d=\sqrt{n^3}$, $b=m^3+2da$, in proceeding,) redu-

cing the given Equations to $\sqrt{m^3y^3}+\sqrt{n^3y^6}=a$; and $n^2y^2+y^2=b$; finding y^3 , by solving a *Quadratic*, to be squared and compared with y^2 cubed, got from the 2d Equation; but so involved with *Radicals* and compound *Terms*, as to fall short of the Purpose. Another Correspondent *misbook* in reducing his substituted Equations from those given, and so lost the Use of his *Quadratic*. — *Mr. Michael Taylor*, of *Marley-hill*, near *Newcastle*, puts $y=mx$ and $x+y=mx$, and proceeds to a *complex final Equation*. — *Mr. Petts* says (from *Mr. Lyns*)

the Question should be thus; $\overline{x^2+y^2}^{\frac{3}{2}}+\overline{xy}^{\frac{3}{2}}=a$; and $x^2+y^2=b$.

Put $x+y=s$, and $xy=p$; then $p^{\frac{3}{2}}=a-b^{\frac{3}{2}}$, or $p=a-b^{\frac{3}{2}}$; which being a known Quantity, put in the 2d Equation: And $s^2-2p=b$, or $s^2=b+2p$; whence $s=\sqrt{b+2p}$. Now s and p being known, $x+y=s$, $xp=p$, squaring the 1st, $x^2+2xy+y^2=s^2$; from which take 4 Times the latter, and $x^2-2xy+y^2=s^2-4p$; whence $x-y=\sqrt{s^2-4p}$; add this to the first, and $2x=\sqrt{s^2-4p}+s$; $\div 2$; and $x=\frac{\sqrt{s^2-4p}+s}{2}$.

VIII. QUESTION 457, (marked VII. 456,) answered by *Mr. Robinson*, of *Biddick*.

1	$x+y+z=b=19.$	}	Required x , y , and z .
2	$xyz=c=240.$		
3	$x^2+y^2+z^2=d=125.$		
1 transf.	$x+y=b-z.$		
2 $\div$	$xy=\frac{c}{z},$ therefore $2xy=\frac{2c}{z}.$		
3 transf.	$x^2+y^2=d-z^2.$		
5 + 6	$x^2+2xy+y^2=d-z^2+\frac{2c}{z}.$		

$$4 \bullet \left| \begin{array}{l} 8 \\ 19 \end{array} \right| \begin{array}{l} x^2 + 2xy + y^2 = b^2 - 2bx + x^2 = d - x^2 + \frac{2c}{x} \\ 2x^3 - 2bx^2 + db^2x = 2c; \text{ solved, } x=6, y=5, z=8, \text{ required.} \end{array}$$

Th. $\left| \begin{array}{l} 8 \\ 19 \end{array} \right| \begin{array}{l} 2x^3 - 2bx^2 + db^2x = 2c; \text{ solved, } x=6, y=5, z=8, \text{ required.} \end{array}$

Mr. George Coughron's Solution.

PUT a, b, c , for the given Numbers, and x, y, z , for the required ones; then will $x+y+z=19$; $xyz=b=240$; and $x^2+y^2+z^2=c=125$;

from the 1st, $x+y+z=19$; from this subtract the 3d, and multiply

the Remainder by $\frac{1}{2}z$, so shall $xyz = x^3 - ax^2 + \frac{1}{2}a^2 - \frac{1}{2}c \times x = b = 240$; the Roots of which Equation are 5, 6, 8, the Numbers required.

Mr. Richard Dalton, of Pool, solved it in the same elegant and accurate Manner; as did Mr. Samuel Smith, of Pakefield, near Loeff, Suffolk; Mr. James Muscroft, of Rotherham; (Mr. Joseph Cowley, of Mr. James Shaw's School, Chesterfield, gave the Numbers.) Mr. Charles Taylor, Pupil in Mr. Brownell's School, Coventry, after a short and neat Process, came to this final Equation,

$$x^3 - ax^2 + \frac{a^2 - c}{2} x = b = 240, (a=19, b=240,) \text{ which solved, he}$$

finds $x=6, z=8, y=5$, as before. Mr. Charles Burton, of Bretby, solved it analytically and truly; as did Messrs Goodlad and Harland, of Cottingham Free-School; Mr. Eschiel Walker, of Stapehill; Mr. John Shadgett, of Rofs; Mr. William Pearson, of Northfields; Mr. John Lynn, of Bolam; Mr. Judson, of Brerly; Gemini, of Moseph; Mr. George Grant, Pupil to Mr. Judson; Mr. W. Hedley, Northumberland; Mr. W. Wilson, of Norwich; Mr. I. H. of Lewes, Sussex; Mr. J. B. L. and W. Sedgwick; Mr. W. Hayes, of Fradsham, Cheshire; and Mr. Robert Arnold, junior, of Brinsworth.

Mr. John Broadbent, of Saddleworth, Yorkshire; Mr. Stephen Hartley; Mr. George Hicks, of Reedsms; and Mr. Michael Taylor, also solved it.

Mr. Alexander Rowe observes, that one of the Numbers must be $= \frac{125}{5} = 25$. Then, $19-5=14$; and that $240 \div 5 = 48$, are the Sum and Product of the other two Numbers; which are evidently 6 and 8, by Inspection.

N. B. When the Differences between the Numbers are but small, the Integer, whose Cube comes nearest to the given Sum of the Squares of the three Numbers, is one of the required Numbers.

Mr. James Potts, of Badlington, solved it by an Equation of the 3d Power.

IX. QUESTION 458, (marked VIII. 457.) answered by Mr. George Coughron:

THIS Question is proposed inconsistently; for, by the Principles of Hydrostatics, the Parts of the same Body, immersed in different Fluids, are as the specific Gravities of those Fluids inversely; whence, as the specific Gravity of Water is to that of Milk (by Emerson) as 1 to 1.031, the Solidity immersed in the Water will be to that in the Milk, as 1.031 to 1; but, by the Question, these Solidities are as 20 to 7, an Impossibility. — If the Ratio of the Parts immersed were right, the Diameter of the Globe could not still be determined; for, let it be great or small, the Parts immersed would be to the whole in a constant Ratio.

Mr. J. Lynn observes, had the Kind of Wood of the Globe, and the Part of it immersed in any Fluid, been given, the Question had been limited.

Remark. This shews the Necessity of Correspondents sending Solutions with their Questions, (or leave others to propose;) it being as necessary as sending Solutions with Enigmas, Refuses, Paradoxes, &c. that their Fitness, for Insertion may

may be judged of: Whereas there is not Time for the Compiler to examine the Propriety of all Questions proposed, were he qualified or disposed for the Task, (especially when proposed in inconsistent Numbers or Data,) when he would oblige his Correspondents, who are pressing for their Publication, and promise to send Answers (which never come) by and by. Hence also appears the Necessity of working out the Numbers in Answers to Questions (where it can be done) for Comparison, and to prevent Mistakes. — Pal. Author.

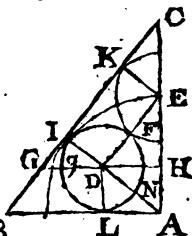
X. QUESTION 459, (marked IX. 458,) answered by the Proposer, Mr. Judson.

PUT $AC = a$, $AB = \frac{30}{2} = 15 = b$, $CB =$

$25 = c$, and call the Semidiameter of one of the Bottom Spheres $= x$. Then, as $1 : d$ (2.1547) $:: x : dx = Hg$, the Semidiameter of the greatest Circle circumscribing the 3 Bottom Spheres. By sim.

Triangles, $a : c :: x : \frac{cx}{a} = DG$; and as $a : b$

$:: a - x : \frac{ab - bx}{a} = HG$. Therefore, $\frac{ab - bx}{a}$ B



$- dx + x = \frac{cx}{a}$; hence, $x = \frac{ab}{c + b + ad - a} = 4.75481$, the Semidia-

meter of one of the 3 lower Spheres; consequently, the Diameter $= 9.50968$ Inches. Secondly, put $d = 4.75481$, the Semidiameter of the lower Spheres, and $g = DH = 5.4904$, $x =$ Semidiameter of the upper Sphere; then $DE =$

$x + d$, and $HE = \sqrt{x^2 + 2dx + d^2 - g^2}$, and $CE = a - d - \sqrt{x^2 + 2dx + d^2 - g^2}$; by similar Triangles, as $c : b :: a - d -$

$\sqrt{x^2 + 2dx + d^2 - g^2} : x$; th. $cx = ba - bd - b \sqrt{x^2 + 2dx + d^2 - g^2}$; but $ba - bd = f$. Now, by squaring each Side of the Equation, and Reduc-

tion, we have $x^2 - \frac{2fc - 2b^2dx}{c^2 - b^2} = \frac{b^2d^2 - b^2g^2 - f^2}{c^2 - b^2}$; which put $= -m$;

and $-2p = \frac{2fc - 2b^2d}{c^2 - b^2}$; then will $x^2 - 2px = -m$; hence, $x = p -$

$\sqrt{p^2 - m} = 4.5914$, the Semidiameter, and 9.1828 Inches, the Diameter of the upper Sphere. Thirdly, put $x =$ the Semidiameter of the Punch-Bowl, $As = x - 2d$; then $AI \times As = AL^2$; th. $x^2 - 2dx = g^2$; hence $x =$

$d \pm \sqrt{g^2 + d^2} = 12.0184$, the Semidiameter; and, consequently, 24.0368 Inches, the Diameter of the Punch-Bowl. W. W. R.

Mr. James Bean Lee, and Mr. W. Sedgwick, of Cottingham-School, find the Diameters of each of the 3 Bottom Globes exactly the same as Mr. Judson's Number, $= 9.50962$; but find the Diameter of the upper Globe $2 \times 4.60841 = 9.21682$ Inches; and the Diameter of the Punch-Bowl $2 \times 12.0172 = 24.0344$ Inches. Mr. James Lamb, Preceptor, at Aldbrough, near Hull, finds (from a Process) the Diameters of the Bottom Spheres $= 9.5096$ Inches; and 9.2028 Inches the Diameter of the upper Sphere, and

$$4 \bullet \left| \begin{array}{l} 8 \\ 9 \end{array} \right| \begin{array}{l} x^2 + 2xy + y^2 = b^2 - 2bx + x^2 = a - x^2 + \frac{2c}{x} \\ 2ax^2 - 2bx^2 + db^2x = 2c; \text{ solved, } x=6, y=5, z=8, \text{ required.} \end{array}$$

Th. $\left| \begin{array}{l} 8 \\ 9 \end{array} \right| \begin{array}{l} 2ax^2 - 2bx^2 + db^2x = 2c; \text{ solved, } x=6, y=5, z=8, \text{ required.} \end{array}$

Mr. George Coughron's Solution.

PUT a, b, c , for the *given* Numbers, and x, y, z , for the *required* ones; then will $x+y+z=19$; $xyz=b=240$; and $x^2+y^2+z^2=c=125$;

from the 1st, $x+y+z=19$; from this subtract the 3d, and multiply

the Remainder by $\frac{1}{2}x$, so shall $xyz = x^3 - ax^2 + \frac{1}{2}a^2 - \frac{1}{2}c \times x = b = 240$; the Roots of which Equation are 5, 6, 8, the Numbers *required*.

Mr. Richard Dalton, of Pool, solved it in the same elegant and accurate Manner; as did Mr. Samuel Smith, of Pakefield, near Lefford, Suffolk; Mr. James Muscroft, of Rotterham; (Mr. Joseph Cowley, of Mr. James Shaw's School, Chesterfield, gave the Numbers.) Mr. Charles Taylor, Pupil in Mr. Brownell's School, Coventry, after a short and neat Process, came to this final Equation,

$$x^3 - ax^2 + \frac{a^2 - c}{2} x = b = 240, (a=19, b=240,) \text{ which solved, he}$$

finds $x=6, z=8, y=5$, as before. Mr. Charles Burton, of Bretby, solved it analytically and truly; as did Messrs Goodlad and Harland, of Cottingham Free-School; Mr. Enrich Walker, of Stapenhill; Mr. John Shadgett, of Roke; Mr. William Pearson, of Northfields; Mr. John Lynn, of Boleyn; Mr. Judson, of Beverly; Gemini, of Macclesfield; Mr. George Grant, Pupil to Mr. Judson; Mr. W. Hedley, Northumberland; Mr. W. Wilson, of Norwich; Mr. I. H. of Lewes, Sussex; Mr. J. B. L. and W. Sedgwick; Mr. W. Hayes, of Frolsham, Cheshire; and Mr. Robert Arnold, junior, of Brinsford.

Mr. John Broadbent, of Saddleworth, Yorkshire; Mr. Stephen Hartley; Mr. George Hich, of Redmoss; and Mr. Michael Taylor, also solved it.

Mr. Alexander Rees observes, that one of the Numbers must be $\frac{125}{5} = 25$. Then, $19-5=14$; and that $240 \div 5 = 48$, are the Sum and Product of the other two Numbers; which are evidently 6 and 8, by Inspection.

N. B. When the Differences between the Numbers are but small, the Integer, whose Cube comes nearest to the given Sum of the Squares of the three Numbers, is one of the required Numbers.

Mr. James Potts, of Badlington, solved it by an Equation of the 3d Power.

IX. QUESTION 458, (marked VIII. 457.) answered by Mr. George Coughron:

THIS Question is proposed inconsistently; for, by the Principles of Hydrostatics, the Parts of the same Body, immersed in different Fluids, are as the specific Gravities of those Fluids inversely; whence, as the specific Gravity of Water is to that of Milk (by Emerson) as 1 to 1.031, the Solidity immersed in the Water will be to that in the Milk, as 1.031 to 1; but, by the Question, these Solidities are as 20 to 7, an Impossibility. — If the Ratio of the Parts immersed were right, the Diameter of the Globe could not still be determined; for, let it be great or small, the Parts immersed would be to the whole in a constant Ratio.

Mr. J. Lynn observes, had the Kind of Wood of the Globe, and the Part of it immersed in any Fluid, been given, the Question had been limited.

Remark. This shews the Necessity of Correspondents sending Solutions with their Questions, (or leave others to propose;) it being as necessary as sending Solutions with *Ænigmas, Rebuses, Paradoxes, &c.* that their Fitness for Insertion may

may be judged of: Whereas there is not Time for the *Compiler* to examine the *Propriety* of all *Questions* proposed, were he qualified or disposed for the *Task*, (especially when proposed in *inconsistent Numbers* or *Data*,) when he would oblige his *Correspondents*, who are *pressing* for their *Publication*, and promise to send *Answers* (which never come) by and by. Hence also appears the *Necessity* of working out the *Numbers* in *Answers* to *Questions* (where it can be done) for *Comparison*, and to prevent *Mistakes*. — *Pal. Author*.

X. QUESTION 459, (marked IX. 458,) answered by the Proposer, Mr. Judson.

PUT $AC = a$, $AB = \frac{30}{2} = 15 = b$, $CB =$

$25 = c$, and call the Semidiameter of one of the Bottom Spheres $= x$. Then, as $1 : d$ (2.1547) $:: x : dx = Hg$, the Semidiameter of the greatest Circle circumscribing the 3 Bottom Spheres. By *sim.*

Triangles, $a : c :: x : \frac{cx}{a} = DG$; and as $a : b$

$:: a - x : \frac{ab - bx}{a} = HG$. Therefore, $\frac{ab - bx}{a}$ B L A

$= dx + x = \frac{cx}{a}$; hence, $x = \frac{ab}{c + b + ad - a} = 4.75481$, the Semidia-

meter of one of the 3 lower Spheres; consequently, the Diameter $= 9.50962$ Inches. Secondly, put $d = 4.75481$, the Semidiameter of the lower Spheres, and $g = DH = 5.4904$, $x =$ Semidiameter of the upper Sphere; then $DE =$

$x + d$, and $HE = \sqrt{x^2 + 2dx + d^2 - g^2}$, and $CE = a - d -$

$\sqrt{x^2 + 2xd + d^2 - g^2}$; by similar Triangles, as $c : b :: a - d -$

$\sqrt{x^2 + 2xd + d^2 - g^2} : x$; th. $cx = ba - bd - b \sqrt{x^2 + 2xd + d^2 - g^2}$; but $ba - bd = f$. Now, by squaring each Side of the Equation, and Reduc-

tion, we have $x^2 - \frac{2fcx - 2b^2dx}{c^2 - b^2} = \frac{b^2d^2 - b^2g^2 - f^2}{c^2 - b^2}$; which put $= -m$;

and $-2p = \frac{2fc - 2b^2d}{c^2 - b^2}$; then will $x^2 - 2px = -m$; hence, $x = p -$

$\sqrt{p^2 - m} = 4.5914$, the Semidiameter, and 9.1828 Inches, the Diameter of the upper Sphere. Thirdly, put $x =$ the Semidiameter of the Punch-Bowl, $As = x - ad$; then $AI \times As = AL^2$; th. $x^2 - 2dx = g^2$; hence $x =$

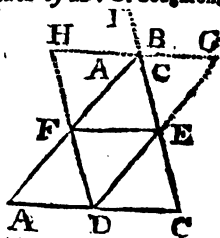
$d \pm \sqrt{g^2 + d^2} = 12.0184$, the Semidiameter; and, consequently, 24.0368 Inches, the Diameter of the Punch-Bowl. W. W. R.

Mr. James Bean Lee, and Mr. W. Sedgwick, of Cottingham-School, find the Diameters of each of the 3 Bottom Globes exactly the same as Mr. Judson's Number, $= 9.50962$; but find the Diameter of the upper Globe $2 \times 4.60841 = 9.21682$ Inches; and the Diameter of the Punch-Bowl $= 2 \times 12.0172 = 24.0344$ Inches. Mr. James Lamb, Preceptor, at Aldbrough, near Hull, finds (from a Process) the Diameters of the Bottom Spheres $= 9.5096$ Inches; and 9.2028 Inches the Diameter of the upper Sphere, and

"Top; as I have some Time experienced. As I am as subject to err as any other Man, so, as any other Person, I am open to Conviction."

XIII. QUESTION 462. (marked XII. 462.) answered by Mr. G. Coughron.

JOIN the Centers of the 3 Sides, D, E, F, of any Triangle, ABC, and it will be divided into 4 equal and similar Parts; (and the Sides of the inner Triangle will be, respectively, parallel to the Sides of the external or outer Triangle): For, by *Euc.* 6. 6. the Triangles AFD, DCE, EBF, are each similar to the including Triangle, ABC, and therefore are similar to one another. Also the Lines, DE, EF, FD, are parallel to AB, AC, CB, *Euc.* 2. 6. and therefore the internal Triangle, DEF, is equal and similar to each of the three aforesaid Triangles, as that and each of the other Triangles form a Rhombus; consequently, these Triangles are all equal and similar to one another. Q. E. D.



As to the 2d Part of this Question, I have never tried it; thinking there are Demonstrations to it, good enough, already.

Gemini, of Morpetb, gave a similar Demonstration; and Mr. Ezekiel Walker, by a double Triangle, forming a Rhomboides. Mr. G. Grant, of Beverley, solved it; as did Mr. Alexander Rowe; Mr. John Lynn; Mr. George Hicks, of Readnuff; Mr. Hayes, of Fredsbam, Cheshire; Mr. Robinson and Mr. Michael Taylor; Mr. J. B. Lee and Mr. Sedgewick; and Mr. Nicholson, of the Isle of Wight. Mr. James Potts, of Bedlington, gave an elegant Solution and Demonstration, in Latin.

Ocular Demonstration to the 2d Part of the Question, by Mr. Nicholson, in the Isle of Wight.

DRAW HG parallel to AC, and complete the Triangles, FHB and EGB, by DF and DE, continued; when the Triangle, ADF is and similar to BHF, and CDE is and similar to BGE (from what is done by Mr. Coughron): Let the Triangles, FAD and ECD, turn about to the Right and Left, on the Points, F and E, till the Points, A and C, fall into, or coincide with, B. Then will AD and CD (HB and BG) fall into HG, and the Angles A + ABC + C = 2 Right-Angles. Also the Angle ABI = the Angles A + C = the Angles ABH + HBI. To which add the Angle ABC, and the Sum (= the 3 Angles of ABC) = 2 Right-Angles, as before.

XIV. QUESTION 463, (marked XIII. 463,) answered by Mr. G. Coughron.

IT is shewn, in several Places, that the Length and Breadth of a Rectangle is to the Transverse and Conjugate Diameters, respectively, of its least circum-

scribing Ellipsis, as 1 to $\sqrt{2}$; therefore, the Transverse, here required, =

$$36\sqrt{2} = 50.911688, \&c. \text{ and the Conjugate} = 30\sqrt{2} = 42.4264069, \&c.$$

Mr. Alexander Rowe, by drawing the Figure, and taking the Fluxion of the circumscribing Ellipsis, or of an Expression, a Minimum, determines the Transverse to be = 50.90968, and Conjugate 42.428086 Inches: He gives an elegant and small Figure; whereas some Figures sent are much too large. Mr. Robinson, by a small Figure, and fluxional Operation, finds the Transverse = 50.912, and Conjugate 42.426, &c. Mr. Michael Taylor, the Dimensions thereof, 50.911688245, &c. and 42.426406874, &c. Inches, by a Process; Mr. W. Wilson, of Norwich, 50.91156, and 42.428, &c. Gemini, of Morpetb, 50.91, &c. and 42.42, &c. Mr. W. Judson, 50.9112, &c. and

42.430, &c. Mr. *Brounell*, Writing and Mathematical Master, *Cowentry*, 50.911688245, &c. and 42.426406871, &c. Mr. *Samuel Smith*, of *Pakefield*, *Suffolk*, 50.91156, &c. and 42.4264, &c. Mr. *W. Hayes*, of *Frodsham*, *Cheeshire*, 50.9112, and 42.426, &c. Mr. *George Grant*, of *Beverley*, 50.9112, 42.426, &c. Mr. *Hartley*, 50.9116, &c. and 42.4264, &c. Mr. *J. Lynn*, 50.911676, and 42.426395, &c. Mr. *W. Pearson*, of *Northfields*, 50.91168, and 42.426408. Mr. *J. B. Lee* and Mr. *Sedgwick*, 50.904, and 42.42.

XV. QUESTION 464, (marked XIV. 463,) answered by Mr. George Coughron, of Newcastle.

THIS Question is a particular Case of Prob. 40, P. 306, *Simpson's select Exercises*; and, by proceeding according to the Rate there given, we find 1540l. and 1050l. for the Values of the Expectations of the eldest and youngest, respectively, upon their own Legacies; and 140l. and 250l. for the Values of their Expectations upon each other's Legacy: whence, $1540 + 140 = 1680$ l. is the whole Value of the Expectation of the eldest, and $1050 + 250 = 1300$ l. is that of the youngest. W. W. R.

By another Solution, we received from an ingenious Correspondent, he makes 1690l. (nearly,) and 1249l. the Values of the Expectations of the eldest and youngest, respectively; where the Nephews are supposed not entitled to any Thing, unless they survive their Uncle. But, in Case the longer Liver of the two (both dying before the Uncle) be entitled to the Whole, after his Death, then the Value of their Expectations will be somewhat different.

The same answered by Mr. Alexander Rowe, the Proposer.

AN Annuity, upon the Life of the Testator, of 68 Years of Age, (by M. de Moivre's Tables,) is worth 6.91 Years Purchase, which call a ; .035 (the Interest of 1l. at $\frac{3}{2}$ per Cent.) b . Now, suppose the Testator to die before either

of his Nephews, or Legatees; then, $1 - ab \times 2400 = 1819.56$ l. = the

eldest Nephew's Expectation; also, $1 - ab \times 1600 = 1213.04$ l. = that of the youngest. Put $c = 68$, $d = 63$, and $e = 18$, the Complements of Life to

86; then $1 - \frac{c}{2d} - \frac{e}{2e} + \frac{e^2}{3cd} = 0.75$: Hence, $1819.56 \times .75 =$

1364.67l. and $1213.04 \times .75 = 909.78$ l. which are the present Expectations

of the Nephews, arising from the above Supposition. Moreover, $\frac{e}{2d} - \frac{e^2}{3cd}$

$= 0.117647$; and $\frac{e}{2e} - \frac{e^2}{3cd} = 0.1071428$; whence $1819.56 + 1213.04$

$\times .117647 = 356.7763$ l. and $1819.56 + 1213.04 \times .1071428 = 324.9213$ l. which are the second Parts of their respective Expectations. Consequently, 1364.67 l. $+ 356.7763$ l. $= 1721.4463 = 1721$ l. 8s. 11.112d. = total Expectation of the eldest Nephew; and 909.78 l. $+ 324.9213$ l. $= 1234.7013$ l. $= 1234$ l. 14s. 0.312d. = that of the youngest Nephew (see the before cited Author's Doctrine of Chances, P. 285, 287). Q. E. P.

Remark. The judicious Critic may compare the Principles and Conclusions both Solutions proceed on, and finally determine.

XVI. QUESTION 465, (marked XV. 464,) answered by Mr. Alexander Rowe, of Cornwall.

PUT $a = 623.4595$; $b = 89699.4603$; then, from the 1st given Equation, $y^2 = \sqrt{a - x^2}^2 + x^2$, which put in the 2^d, we have $\sqrt{a - x^2}^2 + x^2$

$= \sqrt{a - x^2}^2 + 2x^2 = b$. Resolved, by *Trial and Error*, $x = 18$ Years = the Lady's Age; whence, $y = 300$. her Fortune, required.

Mr. Coughron solves it thus. — He puts a and b to denote the Numbers, above; $v^2 = y^2 - x^2$, $w^2 = y^2 + x^2$; then will the given Equations become $\frac{1}{2}w^2 - \frac{1}{2}v^2 + v = a$, and $\frac{1}{2}w^2 + \frac{1}{2}v^2 - w = b$; by taking their Sum, $w^2 - w + v = a + b$; and putting the Value of v , got from this Equation,

we have $a + b + w - w^2 + w^2 - 2w = 2b$; which reduced, $w^4 - 2w^3 - 2 \times a + b - 1 \times w^2 + 2 \times a + b - 1 \times w = 2b - a + b^2$;

from whence $w^2 = 90324$. $v^2 = 89676$, and thence x and $y = \sqrt{\frac{1}{2}w^2 \pm \frac{1}{2}v^2} = 18$ and 300 . W. W. R.

N. B. Here w must be something more than 300 . The Advantage of Solution from these Sorts of high Numbers, and final Equations, is doubted; but left to Experience.

Mr. Robinson pursues this Solution through 10 regular Steps, and comes to a complex final Equation; from which he finds the Numbers as above. Mr. Michael Taylor answers it from a correct, but complex, final Equation. Mr. Lynn reduces his Equation to a 4th Power, and finds the Value of u , substituted for, $= 4.2426$; and thence he gets 18 and 300, the Age and Fortune. But it appears, that 18 is soonest and best got from a final Equation, without Substitution. Mr. James Lamb, of Aldbrough, near Hull, solves it by a perfect final Equation of the 8th Power, without Substitution; whence he gets 18, and then 300. Mr. Charles Burton, of Bretby, solved it from an Equation, by Trial and Error; as did Mr. R. Judson; Mr. Shadgett, of Ross; Mr. W. Hay, of Frodsham; Mr. Ezekiel Walker, of Stapenhill; Mr. Robert Arnold, jun. of Brinsworth; Mr. G. Grant, of Beverley; and Mr. R. Dalton, of Poole; by a neat Process. Mr. James Muscroft, of Retterham, solved it; Mr. J. B. Lee; and Mr. Sedgwick.

XVII. QUESTION 466, (marked XVI. 465,) answered by Mr. Robinson, of Biddick.

$\frac{1728}{3.5 \times 3.5 \times .7854} = 179.604$ Inches $= 14$ Feet $11\frac{2}{3}$ Inches, the Depth of the Bore, required.

Mr. Coughron finds it in the same Manner, $\frac{1728}{3.5^2 \times .7854} = \frac{1728}{9.62115} = 179.603$ Inches.

Mr. Richard Dalton; Mr. Robert Arnold, jun. Mr. Ezekiel Walker; Mr. John Shadgett; Messrs. Goodland and Havland; Mr. J. Lynn, of Bolam; Mr. Pearson, of North-Shields; Gemini, of Morpeth; Mr. Hedley, Northumberland; Mr. W. Wilson, of Norwich; Mr. J. Scott, of Carwithorne; Mr. Hartley; Mr. Broadbent; Mr. Alexander Rowe; Mr. Jos. Cowley, of Mr. James Shaw's School, Chesterfield; Mr. Samuel Smith; Mr. Judson, of Beverley; Mr.

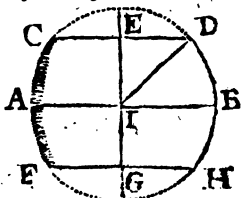
Mr. J. B. Lee; Mr. Sedgwick; Mr. James Muscroft, Rotherham; Mr. J. H. of Leazes; and Mr. James Potts, of Bedlington, Northumberland; answered it; and also Mr. Anthony Young, one of his ingenious young Pupils, who answered the 5th and 6th Ænigmas.

XVIII. QUESTION 467, (marked XVII. 466,) answered by Mr. Robinson.

$$\frac{9.3295}{.5236} = 17.818 : \text{Put } 2x = CD = FH,$$

Diameters; $4x - 4 = EG$, the Depth of the Snuff-Box; $2x - 2 = IE$, by E. 1. 47. ID^2

$= 5a^2 - 8x + 4 \times 4 = 20x^2 - 32x + 4 = AB^2$; then, by a known Theorem, or Rule, we get $88x^3 - 216x^2 + 192x - 64 = 17.818$; solved, $x = 1.34$; therefore, $2x = 2.68$, the Diameters at Top and Bottom; and the Depth $= 1.36$ Inches. W. W. R.



Mr. G. Coughron, of Newcastle, answered it accurately. Mr. Richard Dalton, of Pool, finds (from a Process) the Diameters 2.69494, and Height 1.3898 Inches. Gemini, of Morpeth, finds them 2.7, and 1.4, nearly, from a Process; Mr. James Nicholson, Preceptor, at Stanton, Northumberland, 2.69474, and 1.38948. Mr. Grant, of Beverley, answered it; as did Mr. Judson, and Messrs. Goodlad and Harland, of Cettingham School. Mr. Nath. Brownell, Writing and Mathematical Master, of Coventry, accurately (by a short Process) found the Diameters 2.6947526, and Height of the Box 1.3895052; Mr. James Lamb, 2.694755, and 1.38951; Mr. W. Hayes, of Fradsham, Cheshire, 2.69175, and 1.3835. Mr. W. Pearson, of North-Shields, sent his Method. Mr. J. B. Lee, and Mr. Sedgwick, gave 2.69435, and 1.3891. Mr. W. Wilson, of Norwich, solved it; as did Mr. Smith, of Pakefield; Mr. Alexander Rowe; Mr. Hartley; Mr. Scott, of Carwithorne; Mr. W. Hedley, Northumberland; Mr. Stephen Hartley; and Mr. John Lynn; who finds the Diameter $= 2.69477$, and Height, 1.38948, &c. Mr. James Potts finds the Diameter 2.7, and Depth 1.4, in near Numbers.

XIX. QUESTION 468, (marked XVIII. 467,) answered by Mr. W. Pearson, of North-Shields.

PUT $a =$ Sine of the Ascensional Difference; $b =$ Tangent of the Sun's Depression at Midnight; and $x =$ the Tangent of Latitude: Then the Cosine

of the Tangent $= \frac{1}{x}$. By spherical Trigonometry, as $x : 1 :: a : \frac{a}{x} =$ the Tangent of the Sun's Declination.

Again, as $b =$ the Tangent of Depression, and $\frac{a}{x} =$ the Tangent of Declination; we have the Tangents of two Arcs given, to find the Tangent of their Sum, which will be $= \frac{1}{x}$. By Simpson's Trigonometry, 2d Edition, P. 57,

$$\frac{b + \frac{a}{x}}{1 - \frac{bx}{a}} = \frac{1}{x}. \text{ By Reduction, } x^2 + \frac{a-b}{b}x = -a. \text{ This Quadratic}$$

solved, $x = 3.58204 =$ the Tang. $74^\circ 24'$, the Latitude required.

And the Sun's Declination = $7^{\circ} 59'$, answering to the 10th of April, Rad. is supposed = 1, and the Declination supposed not to vary for a Day; and therefore I suppose the Answer to be sufficiently near. W. W. R.

Mr. Thomas Robinson, of Biddick, sends his Process, (not so short as the above,) by which he determines the Latitude = $74^{\circ} 25'$, (and therefore confirms the Truth of the above Method and Numbers,) and Sun's Declination, $7^{\circ} 58'$, answering to April 10, and September 2.

Mr. George Coughron's Process is as follows.

PUT x = Sine $30^{\circ} 9'$, the Ascensional Difference; t = Tang. $7^{\circ} 37'$, the Sun's Depression, at Midnight, = the Difference between the Co-latitude and Declination; and π = the Tangent of the Sun's Declination; Radius = 1:

Then will the Tangent of the Latitude = $\frac{1 - \pi x}{t + x}$; and, by Spherics, as 1

(Rad.) : $x :: \frac{1 - \pi x}{t + x} : t$, $t = x \times \frac{1 - \pi}{t + x}$; whence x is equal to

$\frac{1 - \pi^2 - 4t^2}{2} + 1 - t$ = the Natural Tangent of $7^{\circ} 59'$, answering to April 10, or September 2. The Latitude is thence found to be = $74^{\circ} 24'$.

Mr. J. Bean Lee, and Mr. Sedgwick, at Cottingham School, find the Latitude $74^{\circ} 24' 4'' 26'''$, and Declination, $7^{\circ} 58' 55'' 34'''$. Mr. Judson finds, by a Quadratic, 7.139027 = the Co-tangent; $7^{\circ} 59'$ (nearly) the Declination. Mr. Grant, of Beverley, finds the Sun's Declination, $7^{\circ} 59'$, nearly; and Latitude, $74^{\circ} 24'$. Mr. W. Wilson, of Norwich, solved it. Mr. Michael Taylor, of Marley-Hill, finds the Latitude $74^{\circ} 24'$, and Declination $7^{\circ} 59'$. Mr. Alexander Rowe and Mr. Hartley solved it.

XX. QUESTION 469, (marked XIX. 468,) answered by Gemini, of Morpeth.

PUT x = greater Number = Farthings that each Elector paid; and put $2d$ = Difference betwixt that Number and the Number of Electors: then the

least Number of Electors will be = $x - 2d$; whence $x - 2d \times x = xx - 2dx = 1172693$ Farthings, (= 1221l. 11s. 1d. 19.) spent or paid by all the Electors. The Square completed, $xx - 2dxx + dd = 1172693 + dd$,

whose Root = $x - d = \sqrt{1172693 + dd}$, the least Root (a whole Number)

that can be, next greater to $\sqrt{1172693} = 1082.9$, &c. But the next greater whole Number = 1083, whose Square = 1172889, which must be = $1172693 + dd$; whence $1172889 - 1172693 = dd = 196$;

whence $d = 14$: Therefore, $x - d = \sqrt{1172693 + 196} = 1083$; whence $x = 1097$, the Number of Farthings paid by each Elector, which is a prime Number; and $x - 2d$ = least Number of Electors, = 1069, another prime Number, whose Product = 1172893 Farthings, (= 1221l. 11s. 1d. 19.) spent at the Election, answering the Conditions of the Question. W. W. R.

REMARK.

REMARK. Had not $dd = 196$ come out a square Number, (to get d in a whole Number,) a bigger square Number must be assumed $= 1172693 + dd$, till dd does come out a square Number. But to effect this (so as to make the Number under the Radical a square Number) may be sometimes difficult, when the Difference $2d$ is great, (and who can tell the contrary?) For, had there been $141.21.4d.39$. spent, $=$

135763 Farthings; then $x - d = \sqrt{135763 + dd}$; then d must be $= 471$, dd

$= 221841$, and $x - d = \sqrt{135763 + 221841} = \sqrt{357604} = 598$; whence x , the greater Number, $= 1069$, and $x - 2d = 127$, the lesser. But here it is harder to get d , than to try all the prime Divisors to 127. This may be called fitting a Question to the Solution, and not fitting a Solution to the Question: A Herculean Task! requiring a better Way of Solution. Palladium-Author.

Mr. John Lynn, of Bolam, Northumberland, and Mr. James Potts, of Bedlington, were the only Correspondents besides who solved this Question in a Manner similar to the former. — Mr. Michael Taylor, of Marley-Hill, examined (he says) all the Divisors, or prime Numbers, till he found the right Divisor, to the Number of Farthings, in the Money spent, (a Herculean Labour!) which was performed also by Mr. Coughron and Mr. Alexander Rowe; and no other Correspondents.

Several of our (otherwise able) mathematical Contributors solve this Question, by insisting that the Number of Farthings spent at the Election, viz. 1172693, is a prime Number, and therefore divisible only by 1; concluding that there were as many Electors as Farthings, each paying 1 Farthing; though as the Number of Electors was expressed to be the least, according to this Way of reasoning, there should be but 1 Elector, who paid the whole Number of Farthings in the Money spent.

Similar to this Sort are the Questions (not hard, yet curious and uncommon) wanted for Novelty, after an Overstock of Ladies Age and Fortune Questions, Trees planted, &c. grown nauseous to the Reader's Palate; as treading so much in the old Track shews a Pack-Horse Dulness and Dearth of Invention; proving that Miss Polly Stow's Filly (in a similar Way of speaking) has distanced many of the staunch Coursers, and beat the Ponies out of the Field.

N. B. Dividing the Product of two high prime Numbers into its Parts or Factors, (which are but two,) is too difficult and tedious to perform by Trial without Analytics, except to the indefatigable Few, Mr. Michael Taylor, Mr. Coughron, Mr. Rowe, &c.

XXI. QUESTION 470, (marked XX. 469,) answered by Mr. Nicholson, Land-Surveyor, and Mathematical Teacher, in the Isle of Wight.

THERE should have been added, at the End of the Question, (as sent by the Proposer, but I suppose omitted in the Haste of transcribing,) The Diameter of whose Orifice, at the Extremity of the Spout, is Half an Inch. Whence, dividing 240, the cubic Inches of Air, contained in the Bellows, by the Area of the Spout, $= \frac{1}{2} \times \frac{1}{2} \times .7854 = .19635$, and the Quotient $= 1222.307$ Inches $= 101.8$ Feet, the Length of the Cylinder of Air forced out of the Bellows in 1 Second. W. W. R.

Mr. George Coughron accurately observes, that the Velocity of the Air, per Second, through the Spouts of the Bellows, is universally $=$ the Altitude of a Cylinder, whose Base is the Area of the Spout, and Solidity $=$ the Content of the Cavity, divided by the Time, in Seconds, in which they are compressed together.

Mr. Judson observes, that if the Area at the End of the Bellows-Spout $= a$, then $\frac{240}{a} =$ the Velocity of the Air through the Spout, required.

Mr. Richard Dalton, of Pool, observes the same; Mr. James Lamb, Preceptor, at Aldbrough, near Hull, observes and determines the same; Mr. Ezekiel Walker, of Stapenbill, the same; Messrs Goodlad and Herland, of Cottingham School, the same, making $\frac{240}{a} =$ the Column of Air discharged in 1 Second of Time.

Mr. Michael Taylor, of Marley-hill, puts $a =$ the Area of the Spout, $A =$ the Content of the Cavity of the Bellows, and $t =$ Time; then, $\frac{A}{at}$ (according to Mr. Coughron) $=$ the Velocity per Second, required. Who says that this Question is similar to one proposed in Fletcher's Universal Measurer and Mechanic; see P. 186. Mr. Alexander Rowe solved it. Mr. W. Hedley, of Northumberland, the Post-Mark of whose Letter was Newcastle, (writing a beautiful modern Hand, not to be excelled) observes, that if the Area of the Spout is $= 1$, that then the Air's Velocity through the Spout will be at the Rate of 24 Inches per Second.

XXII. QUESTION 471, (marked XXI. 470.) answered by Mr. George Coughron.

THE sexagesimal Quantity required is evidently That, whose natural Tangent $= 1$, to the Radius (10000000000) of the Tables, as its Logarithm-Tangent will then be $= 0$. Now it is plain that it must be a very small Arc; and, as the Tangents of small Arcs are nearly equal to the Arcs themselves, the Arc, in the present Case, may be supposed $= 1$; therefore, as 62835853072 (the Circumference whose Radius is 10000000000) : 1 :: 360° 4 v. 27 vi. 19 vii. &c. the sexagesimal Quantity required.

M. B. If the Radius of the Tables were different, the Answer would be so.

Mr. Judson, of Beverly, answers it thus.

THE Logarithm-Tangent of 1' = ... 6.4637261293
The Logarithm of the Numbers 290882.1676 6.4637261293

Difference 0.0000000000

This Difference, being a Quantity less than any assignable, is the Logarithm-

Tangent of $\frac{1}{290882.1676}$ Part of 1 Minute, $= 00^{\circ} 0' 0'' 0''' 0iv. 4 v. 27 vi. 19 vii. 9 viii. .05 +$. W. W. R.

REMARK. We received no other Solutions to this Question than the two foregoing, which are both excellent. See Pall. 1764, P. 71.

The Double of 4 v. 27 vi. 19 vii. 9 viii. .05 $= 8 v. 54 vi. 38 vii. 18 viii. .1x$, whose Complement to 90° $= 89^{\circ} 59' 59'' 59''' 59iv. 51 v. 45 vi. 21 vii. 41 viii. .9$, to which Latitude if a Ship arrives, by sailing from any given Latitude, on the same Course continually, by the Compass, so as to describe the proportional Spiral, she will be exceedingly near the Pole, and may, in Respect of Distance from it, be considered as in it. Whence the Distance from any given Latitude to the Pole, (or

over the Equator) and Difference of Longitude to her Arrival in the Latitude of $89^{\circ} 59' 59''$, &c. will be correctly determined by the known Analogies: The finite Distance, nearly as true as if the Spiral were arrived at the Pole, and the infinite Number of Revolutions, (like an infinite decreasing geometrical Progression,) were summed to the Pole. For there is an infinite Number of Revolutions made from the said Latitude, whose Half-Complement is $= 4^{\circ} 27' 59''$, &c. found by Mr. Judson; but of insignificant Length, thence to the Pole, when summed; though the infinite Number of Revolutions will make the Difference of Longitude to be infinite, beyond the said Latitude, to the Pole; which to that Latitude is finite only and determinable. To which Latitude $89^{\circ} 59'$, &c. (from Mr. Judson's Numbers,) the meridional Parts will be $= 79157$; but of indefinite or infinite Quantity (as the natural Tangents are so) to the greater Latitudes, from thence to the Pole. These Properties, of the Difference of Longitude, and meridional Parts to greater Latitudes, were not at first considered or discovered, when we revised and inserted what is contained in P. 71, Pal. 1764.

The Logarithmic Tangent of any sexagesimal Quantity less than $4^{\circ} 27' 59''$, &c. (whose Logarithmic Tangent is $= 0$) is minus some Quantity, or a negative Quantity.

PRIZE-QUESTION answered by Mr. Richard Judson, of Beverley, Yorkshire.

FIRST, At Page 400 of the Royal Astronomer and Navigator, the Sun's and Moon's mean ecliptic Limits are 18° and 12° , respectively, on each Side the Moon's Node; therefore the Ratio of the Number of solar and lunar Eclipses is as 36 to 24, or as 6 to 4. But Mr. Emerson, at Page 231 of his Astronomy, by taking in the Earth's penumbral Shadow, makes the Limits of the Moon's Eclipse, at a Medium, $16^{\circ} 47'$, and of the Sun's, $16^{\circ} 45'$; and therefore concludes, taking one Year with another, there will be two Eclipses of the Sun, and two of the Moon.

Secondly, By Table, Page 391 of the Royal Astronomer and Navigator, when the Sun is at its nearest, and the Moon at its greatest, Distance from the Earth,

The Moon's apparent Semi-diameter $= 14' 42''$

The Sun's Ditto $= 16' 21''$

Sum 31 3

The Moon's horary Motion $= 29' 33''$

The Sun's Ditto $= 2' 33''$

The Moon's hourly Motion from the Sun $= 27' 0''$

Hence, $\frac{31.05}{27} = 1.15 = 1^{\text{h}} 9^{\text{m}}$, the Semi-duration; and $1^{\text{h}} 9^{\text{m}} \times 2 =$

$2^{\text{h}} 18^{\text{m}}$, the total and greatest Duration of a solar Eclipse; according to Cor. Page 347 of Emerson's Astronomy. Also, from the same Table and Cor. at Page 353,

The Moon's Parallax $= 53' 28''$

The Moon's Penumbra $= 31' 3''$

Sum 84 31

Therefore, $\frac{84.506}{27} = 3.1296$, the Semi-duration, and $6.2592 = 6^{\text{h}} 15^{\text{m}}$

33° , the total Duration, of the greatest general Eclipse of the Sun, or Eclipse of the Earth, that can happen.

Thirdly,

Thirdly, When the Sun and Moon are at their greatest Distance from the Earth, then

$$\begin{aligned} \text{The Moon's horizontal Parallax} &= 53' 28'' \\ \text{The Sun's Ditto} &= 10 \end{aligned}$$

$$\begin{aligned} \text{Sum} & 53 \ 38 \\ \text{Sun's Semi-diameter} &= 15 \ 49 \end{aligned}$$

$$\begin{aligned} \text{Difference} & 37 \ 49 \\ \text{Earth's Atmosphere} & 50 \end{aligned}$$

$$\begin{aligned} \text{Semi-diameter of the Earth's Shadow} & 38 \ 39 \\ \text{Semi-diameter of the Moon} & 14 \ 42 \end{aligned}$$

$$\text{Sum} \ 53 \ 21$$

$$\begin{aligned} \text{The Moon's horary Motion} &= 29 \ 33 \\ \text{The Sun's Ditto} &= 2 \ 23 \end{aligned}$$

$$\text{The Moon's hourly Motion from the Sun} = 27 \ 10$$

$$\text{Then, by Cor. 1. Page 339 of Emerson's Astronomy, } \frac{53.35}{27.16} = 1.9638 =$$

$3^h \ 57^m \ 40^s$, the Semi-duration, and $1^h \ 57^m \ 59^s \times 2 = 3^h \ 35^m \ 38^s$, the total Duration, of the greatest Eclipse of the Moon that can happen. Q. E. F.

Solution to the PRIZE-QUESTION, by Mr. G. Coughron, of Newcastle.

THE *Ecliptic Limits* of a solar and lunar Eclipse, at a Medium, are about 16° and $11\frac{1}{2}^\circ$ from the Node, respectively: Now, as it is more probable that an Eclipse will happen at any one Part within the Limits, than at another, it is evident, that the Number of Eclipses will be as the Lengths of the Limits; and therefore the Number of solar Eclipses to the Number of lunar Ones, that generally happen, are as 16 to $11\frac{1}{2}$, or as 32 to 23, or 7 to 5, nearly.

Again, since the Duration of a solar Eclipse may be equal to the Time that the Moon's horary Motion from the Sun is in passing over the Sum of the Change of the Moon's Parallax, during the Time of the Eclipse, and the Sum of the Sun and Moon's Diameters; or (which is the same) equal to the Time that the Moon's said horary Motion, less her mean horary Change in Parallax, during the Eclipse, is in passing over the Sum of the Sun and Moon's Diameters; the greatest Duration will evidently be when the Sum of their Diameters, divided by the Difference of the said horary Motions, is greatest. Now, the Sum of their Diameter, when greatest, is about $66\frac{1}{2}$, the said horary Change in Parallax, when greatest, (or the Sun in the Equinoctial, the Place in the Equator, and the Middle of the Eclipse at Noon) $= 15'$, and, by supposing the said horary Motion of the Moon $= 30'$, (which is as little as we can take it in this

Circumstance,) we have $66.5 \div 30 - 15 = 66.5 \div 15 = 4\frac{1}{2}$ Hours, very nearly, for the greatest Duration of a solar Eclipse.

And, since the greatest Duration of a lunar Eclipse is equal to the longest Time that the aforesaid horary Motion of the Moon is in passing over the Sum of the Earth's Shadow and the Moon's Diameter, we have, by supposing the said Sum, when greatest, $126'$, and the horary Motion $= 30'$, as above, $126' \div 30 = 4\frac{1}{2}$ Hours, nearly, for the longest Duration of a lunar Eclipse.

Scholium. These Numbers are not the exact Limits of Duration, which was not my Design to give, but only an Approximation. To determine the Limits of Duration, accurately, requires a great Number of Particulars to be taken into Consideration, (not here taken Account of,) which would render a Solution utterly

utterly impracticable. But these Numbers, however, as well as those for the Ratio, will not widely differ from the Truth.

N. B. A general Eclipse of the Sun may last 6 Hours — The foregoing Duration being for a particular one.

Remark by the Palladium-Author. These two are the only Solutions we have received to the Prize-Question, from among all our numerous Correspondents: They sufficiently illustrate the Talents of the two distinguished Authors. To the former of whom (Mr. Judson, of Beverley, in Yorkshire,) the Prize, of 12 Palladiums, happens to be assigned by Lot; though the latter Solution, by Mr. Cugbron, has its assigned Merit.

Usefulness and Variety are still wanted in the Questions furnished; Things plain and useful, and such as can be applied to Practice in the Affairs of Life, and tend to Utility and the Improvement of Science: Things of Curiosity, Amusement, and Entertainment, in the several Branches of Science, as well as in Literature, are also admitted, for general Speculation, as well as Practice; in which too much Sameness and Common-place are cloying to the judicious Reader's Taste. — But for Correspondents to object to the Defect in the Choice of Questions sent us, and inserted, because they are speculative in an Excess, is the same as objecting to Questions proposed by the most distinguished Authors, (Mr. Emerson and others,) would be, who proposed numerous Speculative Questions, for Patterns, when referred to what is practical and useful in Affairs of Life.

All Books of Arithmetic, Algebra, Geometry, and Fluxions, containing Questions for the Learner's Practice and Improvement, are taxable with the same Fault, of being speculative, (though referred to what is practical;) and, if the Books on arithmetical and mathematical Subjects contained Nothing but what is immediately applied to Practice, it would be difficult to find Instances enough, in the practical Way, for Patterns, to qualify the Learner in all the Branches of those Subjects. The Difference seems to lie in the Elegance and Propriety to be found in the Choice of speculative Questions and Subjects in some more than in others: For those Questions, that are sometimes sent us for being practical, are nevertheless speculative in their Solutions. It is the same by Enigmas, Queries, Questions, &c. sent us, as by poetical and mathematical Compositions of all Sorts: Those, falling short of the Elegance and Perfection contained in the Works of Homer and Newton, are objectable to by the Critics, who shew their Judgement in finding out Defects in others, which themselves are not entirely free from. The Prize-Question for last Year was not attempted to be answered (though a proper one) by some Correspondents, who objected to the general Defect of all the Questions, as being more speculative than practical. And Compositions on all Subjects are liable to the same Objection, of not being perfectly perfect; as all Men have their Degrees of Wisdom, Wit, Judgement, Strength, Ability, Breeding, &c. one above another; yet all must be suited with their Likings according to their different Tastes, Fancies, and Capacities. (See Head to the Questions for 1773.) In a COMMUNITY, constituted of Persons of various Tastes, Likings, and Pursuits, it would be as inconsistent for the Versifier to object to the Objects of the Philomath, (for very few Men are properly Poets or Mathematicians,) as for the Philomath to object to the Objects of the Versifier; and the same Reason holds good in other opposite Likings. The Plan of our Palladium (like that of a Play-house) requires that Correspondents of all Tastes and Likings should be obliged, and not those of any one particular Class to be obliged only. And, with Respect to the Difference in the Rank of Correspondents, the Adept's or Gentleman's Name must sometimes stand next to the Smatterer's and Mechanic's, as the Esquire, the Parson, and the Candler, sometimes sit next each other at a Play, where all Sorts of Persons, for the Audience, contribute to pay the Expenses of the House, buying the Wit, Humour, and Buffoonery, (or the refined and coarse Sentiments,) exhibited on the Stage, contrived to suit all Capacities.

*'Tis with our Judgements as with our Watches, none
Go just alike, yet each believes his own.* Pope's Criticism.

As the *Difference of Talents, Likings, Talents, and Capacities*, of Men, in a Community, contributing all together, answers the *different Views and Ends of the Whole*, (as designed by the great *PLANNER of the Universe*,) so the different *Jacks or Keys of the same Harpsichord, or Spinnet*, contribute in their several *Stations maintained*, to constitute the *general Harmony*.

*Condition, Circumstance, is not the Thing,
Bliss is the same in Subject or in King,
In who obtains Defence, or who defend,
In him who is, or him who finds a Friend.* Pope's Ethics.

CORRECTIONS. By Mr. Alexander Rowe.

An Answer to the PRIZE-QUESTION, at P. 63, Palladium 1771.

BY Mr. Hodgson's *Tables of Annuities*, the *Values of the Lives of 37 and 38 Years of Age* (Interest at 4 per Cent.) are 11.9836 and 12.7715 *Years Purchase*, respectively. Put $11.9836 = a$, $12.7715 = b$, and $.04 = c$; then we have

this well-known *Theorem*, $a + b - \frac{ab}{a + b - abc} = 16.5413$ *Years*; the *Value*

of the *Life of the last Liver*. Then we have this well-known *Theorem*,

$$\frac{150}{1 - \frac{1}{16.5413}} = 314.2677 \text{ } \approx 314 \text{ } 53 \text{ } 4 \text{ } \frac{1}{2} \text{ } = \text{the true Annuity,} \\ \text{[required.]} \\ 1 - .04 \text{]}$$

Note, $\frac{ab}{a + b - abc} = 8.2138 = \text{Value of the joint Lives. — This confirms}$

the *Truth of Mr. Judson's Solution*, at P. 57, 58, *Pall. 1772*, (except Mr. *Coughron* is deceived,) and his *Conclusions* would doubtless have been precisely the same, had the *Interest-Tables*, used by Mr. *Judson*, been as accurately computed as those by Mr. *Hodgson*. Mr. *Roué* puts in his *Claim of Merit* for this *Solution*, and proposes to draw a *Bill* on Mr. *Coughron*, but perhaps the *Bill* may not prove good or be accepted.

A correct Answer to QUESTION 433, P. 63, Pall. 1771, as printed.

PUT $xy = a$, then, by *Substitution*, the 1st Equation will be $a^2 + ay = 3480$, solved, by *Trial and Error*, $a = 15.1319 = xy$. Now put $x + y = z$; then,

from 2d *Equat.* we get $x + \frac{a}{x} = b$; th. $x^2 + a = bx$; th. $x^2 - bx = -a$,

Whence, $x = \sqrt{\frac{b^2}{4} - a} + \frac{b}{2} = 17.90861$ *fers*; thence $y = 84495$, &c. [or *Vice versa*. W. W. R.]

P. 50, *Pal. 1772*. CD (I apprehend) should be $40 \times 2 = 80$ *Feet* = *Dist.* the *Timist* must stand from the *first Rank*, required; because 3 *Ranks* have 2 *Intervals*, each 40 *Feet*; and there seems to be 3 used in the *Solution*.

By Mr. *Coughron's Proportion*, P. 52, *Pal. 1772*, we get, by taking the *Earth's Radius* = 3984.6 *Miles*, the *Person's Distance* from the *Earth's Center* = 6620.97, &c. *Miles*; th. $6620.97 - 3984.6 = 2636.37$ *Miles* = the *required Height or Distance of the Observer's Eye* from the *Earth's Surface*; agreeing exactly with my *Answer* sent last Year. — *Corollary*. By Mr. *Sadler's Hint*, P. 51. same *Pal.* $3984.6 \times .66164 = 2636.37$ *Miles* = *required Dist.* as before.

With *Regard* to what is said, P. 60, *Pal. 1772*, "That the given *Equation*,

" $a^2 - x^2 \times y^2 = x^4$ [it was said by *Boltoniensis*] is *unlimited* and *impossible* :"
Quære, whether this proves that the *Expression* for the *Solidity* of the *circumscribing*

scribing Cone (found from the above Equation) will not admit of a Minimum? [*Why was it not so proved by a proper Solution given?*] And whether, in $y =$

$\frac{a}{o} \sqrt[3]{\frac{a}{3}}$, not $\sqrt[3]{a^4}$, the Cypher, or o, be a real Divisor, or Multiplier, since an Unit, or 1, cannot multiply or divide any significant Quantity to alter it? But another Quantity (or representative Number) than 1, dividing or multiplying 1, or another Quantity, will change its Value; yet o, as well as any of the 9 Figures, or any Number composed of them, multiplying or dividing a Quantity, will be a real Representative of Quantity (how much); as o is a real Representative in $x^0 = 1$ and

$\frac{1}{1000}$, &c. ad Infinitum, $= o$. Whether $\sqrt[3]{a^4}$, inserted, should not be $\sqrt[3]{a^4}$?

[The 3, at the Head of the radical Mark, might be left out by the Printer, comparing whose Mistakes with those of the Correspondents in transcribing, we find they can make as many.] — What Mr. Hartley says, at P. 32, Pal. 1772, is true, but I knew Nothing of it when I sent the Quere. — ALEXANDER ROWE.

REMARK by Pal. Author. Hence Mr. Newland's instead of Mr. Rowe's Name might be put to the Quere, through Mistake, in our transcribing.

Other CORRECTIONS of Pal. 1772, by a very candid and ingenious Correspondent.

P. 37. L. 3. fr. Bot. for $64\frac{1}{2}$ read $46\frac{1}{2}$. P. 38. L. 2. for 8476×6.472 read $8476 \times 6.472 \times 32$. Same Page, L. 5. fr. Bot. for $57r. 51y$. P. 40. L. 5.

for $x \sqrt{b - 44 - x^2}$ in the Denominator, r. $\sqrt{56 + x \sqrt{b - 100 - x^2}}$. P. 41.

L. 6. fr. Bot. for $1s. 4d. \frac{1}{4} r. 8s. 4d. \frac{1}{4}$. P. 42. L. 2. for $\frac{171}{2} r. \frac{105}{6} =$

17.5. P. 43. Mr. Sadler's Answer is only true when $AP = PG$, that is, when PB , produced, passes through D , in which Case it may be answered without Algebra. P. 44. L. 18. for Triangle r. Angle, and L. 19. for inscribed r. contained.

Same Page, L. 7. from Bot. for $= r$. — P. 48. L. 3. fr. Bot. omit y , after *terminating*. P. 49. L. 16. fr. Bot. for *Altitude* r. *Sine Alt.* P. 50. Mr. Robinson's Solution wrong. Mr. Grant's is only a particular Case. P. 51. L. 20.

for 3.5388 , &c. r. 4.636 , &c. P. 52. L. 27. after *Center*, r. and therefore the Height above the Surface $= 2636\frac{1}{2}$, &c. In Fig. E is omitted, where OG cuts the Circle. P. 53. L. 18. Omit $xy^2 =$. In the Fig. Line OB is omitted P. 54. L. 13. fr. Bot.

for $x - \frac{1}{2} r. x - \frac{1}{3}$. P. 56. L. 24. for $\sqrt{AD^2 - DC^2} r. \sqrt{AD^2 + DC^2}$. L. 2. fr. Bot. omit the last $=$. L. 30. for $BC r. EC = \frac{1}{2} AC$. P. 58. L. 3. fr.

Bot. for Cot. $\frac{AC - AB}{2} r. Cot. \frac{AC + AB}{2}$.

Farther CORRECTIONS of PALLADIUM, 1772.

MR. Michael Taylor's Name, of Marley-hill, belongs to Quest. 426 and 428, as he informs us. Hence the Necessity of Contributors putting their Names to each Question and Enigma sent us, to prevent Mistakes in transposing. This Gentleman says he has examined Mr. Lotze's Solut. to XI. Quest. 433, and finds his Method to be true, but his Numbers erroneous; for, by Simpson's Exercises, he finds $p = 15.1319734$ true to the last Decimal; therefore he says that his last Equation is erroneous; for it will be $s^3 - 30.263946s = 6028$. Hence, $s =$

18.7535627 , (from Simpson before,) and th. $\frac{1}{2} s \pm \sqrt{\frac{1}{4} s^2 - p} = 17.9086073$, or 849553 , the required Values of x and y .

Mr. Taylor, going over Solut. to XVII. Qu. 439, finds $DC = 2632.2708$, the Height of the Observer's Eye from the Earth; and $BC = 6611.14386$ Miles, the

the Height of his *Eye* from the Earth's Center, which Number, last Year, he made by Mistake 66011.4586; and then taking the Earth's Rad. from thence another Mistake remained, viz. 62032.5836 Miles.

Another ingenious Correspondent, of Northumberland, (who writes an elegant and flowing Hand,) who signs *William Wimple, Philomath*, in one Place, in another, *Faricwell*, has favoured us with the following Observations.

P. 40. L. 6. fr. Top, the Substitution is wrong; [being a short Word for erroneous.] P. 47. that Messrs *Lynn, Hicks, Judson, and Rowe*, too, are wrong in answering *Quest. 434*. P. 54. Mr. *Hartley's* Solution to *Qu. 443* is wrong, for the Proposition is not true. — This Correspondent proposes 2 *Queres* thus.

1. Which of the Answers to the Prize-Question, 1771, (see *Pal. 1772*, P. 57, 58,) is right?

2. Which of the Answerers of *Qu. 339* did see the Pole? See *Pal. 1772*, P. 51, 52. *Will. Wimple* (Successor to *Will. Honeycomb*) has not shewn what the *Wrong* is, or of what Species or Kind; therefore it is hoped that *Will* will favour us with the Particulars for next Year's *Palladium*, if he expects to be obliged in an Answer to his 2 *Queres* concerning Answerers.

We thank Mr. *Wimple* for his 4 Questions, which are not, according to our Plan, for Schools, but for Adepts.

1. Whether the Forces and Velocities of Bodies in Motion are equal? or whether the Force is as the Square of the Velocity, as Leibnitz and some of his Followers think?

2. What are the Diameters of two non-elastic spherical Balls, expressed by

$$\frac{m}{n} \quad \frac{n}{m}$$

x and x , moving the same Way, (the former with the Velocity a , and the latter with the Velocity b), when the Momentum, after the Stroke, is the least possible?

3. Where a Cock must be fixed to a cylindrical Pipe full of Water, standing perpendicular to the Horizon, to spout Water 3 Feet from the Bottom, (the Vessel being kept constantly full of Water,) when a Cock, being fixed 5 Feet from the Bottom of the same Pipe, spouts to the Distance of 7 Feet, on a horizontal Plane?

4. To divide a Piece of Land (the Content 8 Acres) equally between two Brothers, by a Line drawn parallel to the Ordinate of the bounding Curve, Semi-Ordinate, and Abscissa, the Equation of which Curve being expressed by $ax^{\frac{1}{2}} = y^{\frac{2}{3}}$;

where $a = 10$ Chains: And to shew the Dimensions of this Land so to be divided?

Whoever chuses to resolve Mr. *Wimple's* Enquiries are now at Liberty to do it.

Mr. *Pearson* informs us, that the Number 2697, at P. 52, last *Pal.* should have been 2637; [no Wonder, when the Correspondents make as great Mistakes in their Transcriptions as the Printers in their Compositures.] Who observes, that *Quest. IV.* in *Pal. 1772*, by Mr. *Robinson*, was proposed as it is before he was born; for he found it among some of his old rubbishing Papers, and believes it was a *Diary Question*, as there is a *Diary Prize-Question* proposed on the same Sheet. He wonders that Men of Reputation should fall into such disreputable Practices; and says that it was also sent to the Gentleman's *Diary*. He would have a Law made by *Apollo* to annul such Practices for the future; to which we subscribe. *Pal. Author.*

The Letter (from a Northumberland Correspondent) said to have been paid for to us, is a Mistake; it was refused in London, (because not paid,) where it was directed into the Country, and double charged: It was received at Portsmouth, (by Mistake of a Friend,) but, after opening and extracting the Contents, returned back whence it came, to the proper Owner.

At an Election, a great Number of Electors can better afford to treat one Member, than one Member to treat the whole Number of Electors, for public Good.

Mr. *Hayes* observes, that the 2d Question, proposed by himself, is in *Simpson's Algebra*, 2d Edition; that the 1st Question is similar to one in the same Book, P. 369; but says he was ignorant of it when the Question was sent.

CORRECTIONS of this Year's PALLADIUM, 1773.

P. q. L. 9. fr. Bot. for *May* 1, read *April* 1. P. 31. L. 7. for *Phantom* read *Phantoms of the Night*. *Phantom* (though but a single Letter short) is a Destruction of the true Sense and Idea, and great Injustice done to Mr. Gumley's enchanting and rapturous *Musel* — PALLADIUM-AUTHOR.

NEW ÆNIGMAS.

*Ænigmas serve to strike the Mind ;
That Truth, by searching, you may find.
Fable, Allusion, Simile,
Please and improve by Imagery :
These Things please some ; those others suit ;
And each admires his own Pursuit.*

I. ÆNIGMA 227, by Mr. Isaac Gumley, of Countesthorpe, Leicestershire.

MAKE Room, ye scribbling *Wits*, make Room,
Now I to shew my Face am come. —
I always on the *Ladies* wait,
In single or in married State ;
And, sooner than I'll stay with Men,
I'll lie confin'd in some dark Den.

I am a brisk and lively Spark,
And love to play with *Doll* i'th' Dark :
Yet, — hark ! ye *Ladies*, — what d'ye think ?
Some say that I'm inclin'd to *Drink* ;
Yet *Ale* I always have defy'd,
And *Liquors* strong I can't abide ;
Of *Wine* I likewise am a Hater,
Nor have I ought to do with *Water*.

In Knowledge I've great Progress made,
And am a Friend to ev'ry Trade ;
But *Bis—ps*, *Pa—ns*, and such Fellows,
Who make good honest *Husbands* jealous,
Who preach and pray, to fill their Purses,
Though Nought so frequent as their *Curses*, —
With them I no Communion hold,
Though I'm likewise a Friend to *Gold*. }
Now let my Name and Use be told.

II. ÆNIGMA 228, by the Rev. T. Vaughan, A. M. Morpeth.

ÆNIGMATISTS, come tell me now,
Why I am never thought, by you,
A Subject worthy to appear,
'Mongst others of less Note, I fear.

I serve my Country very well,
Though in a *Cave* I'm known to dwell.
There's not a Person, in the Land,
Who would not take me by the Hand,
Even to *George*, our sov'reign King,
I Pleasure both and Profit bring.

Men very often, without me,
Would be reduc'd to Misery.
But then again, I needs must say,
At other Times I kill and slay.
My *Parents* are a cursed Crew,
For Wickedness out-done by few.
Take this one Hint, (none can deny,)
I the whole *Navy* do supply.

THE BRITISH PALLADIUM, OR

III; *ÆNIGMA 229, by Mr. Isaac Gumley, of Countesthorpe.*

SINCE Subjects quite mean have engross'd whole Pages,
Permit me to speak, *enigmatical* Sages.
We're *Twins* by our Birth — this you freely will own, —
As soon as our Properties to you are known :
And truly we are as much like, to each other,
As ever was any Man unto his Brother.
We boast not our Riches and lofty Descent ;
Our Lot, high or low, can afford us Content ;
Yet sometimes with Envy — But here we must hold :
You see us bespangled with *Diamonds* and *Gold*.

To travel we have, from our Births, been addicted,
For that very often our Dress is neglected.
In *London* we've been at the *Operas* and *Balls* ;
The *Tower* and *Museum*, as well as *St. Paul's* :
At the *Park* and *St. James's* we likewise have been,
And often have walk'd with the King and the Queen.
We've been in each City and Village 'th' Nation,
And travell'd through Kingdoms beyond the wide Ocean.
With the *Hers* we go, in the *Midst* of the War,
And wait upon *Miss* when she plays the *Guider* ;
Yet our Station, *dear Ladies*, quite humble is found ;
For our Faces full often embrace the cold Ground.

IV. *ÆNIGMA 230, by Mr. Nicholson, Preceptor, at Stanton, Northumb.*

1. FROM Mother Earth our Parent came,
But different is our Form ;
Man fashion'd us, and thence our Name ;
For we his *Work* perform.
2. Some round, some square, and some oblong,
So different we are made ;
One Office does to us belong ;
We aid the *Workman's* Trade.
3. I in my *Midst* a Mouth have got,
Sufficient for my Food ;
Whether you think it hard or not,
I'm forc'd to prey on Wood.
4. One *Tooth* of *Steel* is all I have,
By which my Food I eat ;
Though little at a Time I crave,
I Eating oft repeat.
5. I've neither *Entrails*, Head, nor Brain,
And only have one Hand :
Yet strange ! my *Back* does that sustain ;
By which you me command.
6. Upon my *Belly* oft I glide ;
Makes *rugged* Ways quite ev'n :
And now my *Name* you may decide,
By what Account I've giv'n.

V. *ÆNIGMA 231, by Mr. Stuckfield, of Stepney.*

I strangely am form'd ; for my *Bellies* are two :
To contain all my Food, one *Belly* won't do.
And should you exclaim, that your two-belly'd Creatures
Make Provisions so dear, (as they must be great Eaters,)
In me 'tis not so — and to you I appeal,
That I seldom, if ever, eat much at a Meal ;

And

And I'm sure you will own that Nothing is clearer,
Than that my two Bellies make Nothing the dearer ;
And though 'twill appear that I never did ill,
I am never allow'd my two Bellies to fill.

From Belly to Belly my Food is still lasting,
As fast as your Hours and your Minutes are wasting.

VI. *ÆNIGMA* 232, by Mr. Jos. Scot, of Cawthorne.

TO *Vulcan's* Sons my Form and Shape I owe,
And for my Use, most Men my Merits know :

The wretched *Miser* and the greedy *Elf*

Rely upon me, as their *second Self*.

My Purposes are variously assign'd ;

In *Music* and *Mechanics* me you'll find.

I oft assist the learned Commentators,

And have been made for *lunar Navigators*.

The *Pope*, through me, prescribes to each his *Doom* ;

And sends you to your last and wish'd-for *Home*.

VII. *ÆNIGMA* 233, by Mr. J. Scott, of Cawthorne, Yorkshire.

EXACTLY Letters five my Name compose ;

Backward or forward read, the same are those.

I to the Ladies have a near Relation :

From whence you'll quickly find my *Appellation*.

VIII. *ÆNIGMA* 234, by Mr. Michael Taylor, of Marley-hill.

I am oft *stigmatiz'd* for my Name, farther North ;

Am first brought to Bed, then a *Bed* brings me forth.

IX. *ÆNIGMA* 235, by Mr. Isaac Gumley, of Countesthorpe, Leicestershire.

WHILE other *Bards* on War exalt their Strain,
Fields stain'd with Gore, and dreadful Heaps of Sain ;

While others sing the *Charms* of her they love,

The Works of Art, and wond'rous Works of *Jove* ;

Dear *Ladies*, we, like proud, ambitious *Elves*,

These Subjects wave, and sing about ourselves.

In ancient Climes, where *Euclid* liv'd of old,

Where Trees bear Spice, and Rivers teem with Gold,

Where *Sol* intensely sheds around his Heat,

Where *Chaos* reigns, and Monsters new retreat,

We were produc'd ; and first appear, to Sight,

The Merchant's Friend, and Sage's chief Delight.

But let us leave those *distant* sultry Climes,

And come to *Britain* and the present Times.

In ev'ry Town, in ev'ry House, we're seen,

From th' humble *Cot*, to the Palace of the *Queen*.

Both rich and poor our kind Assistance crave,

The young, the old, the Coward, and the brave.

In Science, *Newton* ne'er such Depths had gone,

Had not our *Uses* unto him been known.

And you, dear *Maid*s, our needful Help require,

Esteem our Worth, and Usefulness admire :

Yet we're no *Roses*, bespangled o'er with Lace,

Whose Words and Actions are their own Disgrace :

But, dearest *Ladies*, we're most awkward Creatures,

Of monstrous Shape, and disproportion'd Features :

Large *Heads* some have, yet are quite dumb and blind,

To which a *Tail* without a *Body's* join'd :

Hump-back'd, wry-shoulder'd, others you may see,

Though, in our Form, there are no two agree,

But,

But, hold — enough is said: We make no Doubt,
But you will find our *Appellation* out.

XI. ÆNIGMA 236, by the Rev. Thomas Vaughan, A. M. of Morpeth.

OUR Parent was a Man of great Renown,
But now he is much humbled and pull'd down:
We have been very num'rous, as 'tis told,
And were in diff'rent Stations often sold.
Our Price is lessen'd, you may now observe;
In ev'ry Nation which we us'd to serve;
But most of all in *England*, where Men sneer,
And tell us plainly, we've no Business there.
Emp'rors and Kings (our Value once was such)
Thought that for us they ne'er could pay too much.
It would surprize you greatly but to hear
How much esteem'd we once were ev'ry where.
O'er Grace and Justice we had potent Sway,
And Men did our Authorities obey:
Such pow'rful Properties to us were giv'n,
As to blind *Zaël*, that shews the Road to Heav'n.
But now Folks Eyes are open, they perceive
That we are calculated to deceive.
Take these Hints more, which to relate is just,
'Twill give you Caution not in us to trust;
We're all Romance, and Fable, and Deceit,
And may be counted ev'ry one a *Lieut*.
Yet deem'd *infallible*, we are... by some,
And wear the *Horns* of superstitious *Rome*.

XI. ÆNIGMA 237, by Mr. Bayley, of Middleton, Yorkshire.

A Word, of two Syllables, Meaning implies,
What we should abstain from, if prudent and wise;
When read the *reverse*, the Meaning will shew
What *most*, in Reality, wish they may do.

XII. ÆNIGMA 238, by Mr. W. Swift, of Stow.

LIKE blut'ring *Boreas* sometimes I appear,
And, by my *Breath*, you know that I am near;
Like *him*, I puff, and swell, and rage amain,
And rise, and fall, and swell, and puff again:
Sometimes my Fury rises to a Storm,
And yet I help to keep the *Ladies* warm.

XIII. ÆNIGMA 239, by Mr. T. Sadler, of Whitchurch.

WHERE *ylvan* Scenes attract the Eye,
We've rear'd our Heads, and soar'd on high;
And where we quit that first Retreat,
By human Art, we're made complete.
Behold us walk with equal Feet,
And play at *Gambols* in the Street.
Sometimes we stalk through dirty Laner,
To please the jocund Village Swains;
And trip, like *Fairies*, on the Green,
Where Mirth and Jollity are seen.

Behold, we've each a wooden Leg!
But never were brought up to beg.
We've neither Hands nor Arms, ye Fair,
But *Loops* and *Hoops* we have good Share,
We through the Silver Streams convey
'Squire *Richard*, in a sportive Way;

Though

Though Nature's Gifts we but abuse,
 Like Head-dress high, or high-heel'd Shoes ;
Sophia's Delight, at *Horner's* Cost,
 Each set on Horseback — riding Post ;
 One in Silk Stockings cas'd, the other
 In Silver *Habit* grac'd, with Hat and Feather :
 So *Groom* and *Chambermaid*, both by her Merit
 Exalted by the Squire, high Worth inherit ;
 The Chamber-pot forgot, and Stable,
 For flatt'ring Friends now keep a Table.
 We stride, like *Sophia*, o'er a Stile,
 To shew our *Legs*, and make you smile :
 The bloody *Butcher*, with his Steel,
 Walk'd not so tall, nor yet genteel,
 Since first he learn'd to kill a Hog,
 And did become a bloody Dog !
 When he attended *Sophy's* Side,
 And touch'd her Heart, and pleas'd her Pride ;
 Having just run away from Plough,
 And stuck a fatted greasy Sow.
 Some Streams are deep, but yet are still ;
Pshaw ! you may ford them, if you will.
 And *Patagonians* we appear,
 Nor *Depths*, nor *Widths*, have we to fear.

Whoever sends the best Answer, in Verse, to the following *Ænigma*, before
 Candlemas-day next, has a Chance, by Lot, to win 5, 4, and 3 Palladiums.

PRIZE-ÆNIGMA, by Mr. Sadler, of Whitchurch.

IN Woodlands or down in your sweet pleasant Vale,
 Where warbling *Choristers* sing their soft Tale,
 My Parent resided for many a Year,
 'Till a humble Mechanic first made me appear.
 When the Time was claps'd that my Parent must fall,
 Strange *Havock* was made 'midst my Friends great and small ;
 They were flead, cut, and mangled, in ev'ry Part,
 Split, hung, drawn, and quarter'd, and stab'd to the Heart !
 Then an *Artist* stept forth, who to me laid a Claim ;
 Form'd me just as he pleas'd, and so gave me a Name.
 To an *Alle-bouffe* he took me — the *Landlord* he smil'd,
 And caress'd me as close as a Mother her Child.
 To pleasure his Customers now I began,
 Beau, Belle, Pedant, Coxcomb, Maid-servant, and Man :
 I pleas'd these a while ; but, alas ! very soon
 I was curs'd and despis'd — nay, before the next Noon,
 Soon after, I got into Favour again,
 With gentle and simple, and *Hob* of the Plain :
 The Neighbours around much about me did talk,
 And four dapper Blades o'er my Belly did walk :
Lilliputians they are, dress'd in Sable or Black,
 That keep an Account of a doubtful Attack.
 A bold *Braggadocio* the *Combat* now tries,
 Who endeavours, by Stabbing, to put out my Eyes ;
 For my Eyes, like to *Argus*, great Numbers you'll see,
 On my Back and my Belly, belonging to me.
 So now, my dear *Ladies*, so blooming and fair,
 My Name, to the World, you may please to declare.

Remark, by the *Palladium*-Author. *Ænigmas* should be confined to the *Laws of Fable, Allusion, Allegory, and Metaphor*; without being too plain or too obscure. *Ænigmas* on complex Ideas, or remote Subjects, should be avoided.—The best Answers, and Things the most applicable, excellent, curious, and useful, sent, are preferred. Some *Ænigmas* and *Rebuses*, proposed, are too obscure and unlimited. *Ænigmas, Quæres, Rebuses, Paradoxes, and Questions*, should be confined to *Novelty, Curiosity, and Use, as much as possible.*

NEW QUERIES.

By Quæres, either quaint or shrewd,
You find out Truths a Multitude.

I. QUERE 226, by Mr. Isaac Gumley, of Countesthorpe, Leicestershire.

YE lovely Fair, ye soft enchanting Maids,
That love the Town, and haunt the rural Shades,
Say, if ye can, when KISSING first arose,
That Mark of LOVE, and Soft'ner of our Woes;
Say, if you can, inform your faithful Swains,
And you shall have a hundred for your Pains.

II. QUERE 227, by Mr. John Bayley, of Middleton, Yorkshire.
Who was the Wife of Lot?

Can you tell, or can you not?

III. QUERE 228, by Gemini, of Morpeth.

DEFINE the Difference of what you may call

A Conscience that's large, and no Conscience at all.

IV. QUERE 229, by Will. Wimple, Successor to Will. Honeycomb.

IN what Parts of the World, and what Times of the Year,
Is the Sun's Heat the greatest, and least, — make appear.

V. QUERE 230, by Mr. Alexander Rowe, of Cornwall.

A heavy Body, being sunk to the Bottom of any Fluid, will it require more or less Weight than itself to raise it up?

VI. QUERE 231, by R. C. of the Isle of Wight.

WHEN were Guineas first coined in England? and why were they so called?

VII. QUERE 232, by Ens Rationis.

IF whatever is, is right, in the natural World, (according to Mr. Pope's Ethics; in his *Essay on Man*;) and God has formed Nature and her Operations, in all Respects, for the best, why is Rain, or elementary Weather, prayed for in Churches? or why is any Thing prayed for, by the human Species, of defective Judgement, except (according to the wise Socrates,) that God would grant such Things as are fit for us, and keep away such Things as are not fit, in Respect of particular and general Good? — And why are not Curses banished all catholic and Christian Churches, if God and his Providence can award Justice to Criminals, without the Imprecations bestowed from Man's pishful, partial, and weak Judgement, in this Respect; whose whole irregular Race, governed by a lawless Will, seems to be greatly favoured by a gracious and good God, in not being long ago extirpated from the Face of the whole Earth, for the enormous Trespases of the greater Part of them, committed against their Maker and one another?

VIII. QUERE 233, by Orthodox.

WHETHER a Person of the same Name with that signed to the printed Libel, (against the *Palladium*-Correspondents,) going to several of them, at the Beginning of the Year 1771, was not retained, and since continued, as an Assistant-Observer of the Moon, at Greenwich Observatory, about the same Time that the several printed Libels were so industriously conveyed? If so, should not those Libels be reverberated back to the right Owners, or Libel-Makers, (whoever they are,) at Greenwich, whether Jews, Turks, or Infidels, or whether of the masculine or feminine Gender? Or should not as polite a Present be made, in Return, by the *Palladium* Correspondents, to the same Place from whence they were so obligingly sent?

••• Whoever answers the following Quere, in the most rational Manner, shall be entitled, by Lot, to 4, 3, and 2 Palladiums, respectively.

PRIZE-QUERE, by Philo-Sophia.

To the Necromancers of Longitude, for executing the Office of Libeller, Observer, and Calculator-general of the Moon, in the lunar Regions. By Investigation.

THE Husbands to Fathers in Families find,
And the Cuckoo-born Birds to the true of the Kind;
And likewise the Ratio of Cuckows in Marriage,
To the natural-born, without a Miscarriage.
If the Cuckoo-born Birds from the true can't be known,
Nor Father and Son can be sure of his own,
Except by the Likeness, (for who is so wise?)
As Women, both married and single, tell Lies,
How shall Truth be found out, of the one or the other,
Who's Father and Son, and who Sister and Brother,
Except by the Means of an Investigation,
Since Women for ever would follow the Fashion?
Is the Credit the less to be natural-born,*
Since Cuckows in Marriage are subject to Scorn?
Is a Bas—d more Shame than a Son of a W—re?
My Sophia was wed; but the wanton'd before.

* Like Persons of
the first Rank and
Distinction.

NEW REBUSES.

By Rebuses you Things explain;
The Way you choose to rack your Brain.

I. REBUS, by Mr. G. Lacey, of Bridport.

WHAT in soft murr'ring Accents glides smoothly along,
And courts the young Poet's sweet pastoral Song;
What enables us safely the same to pass over?
When join'd, will the Name of a large Town discover.

II. REBUS, by Mr. Swift, of Stow.

A Native, born in Africa,
Will tell my Fair-One, Queen of May.

III. REBUS, by Mr. William Oliver.

WHAT Birds do when they breed their Young,
(No more I need or can say.)

Will shew where lives a blooming Maid,
My mild, good-natur'd Nancy.

IV. REBUS, by Mr. John Bailey, of Middleton, Yorkshire.

A Mater of Time, and what's Latin for and,
Will shew you a Village well known in this Land.

V. A REBUS-ANAGRAM, by Titus Vespasian.

A Cardinal Point, if right you transpose,
A Town's Name in Yorkshire to you will disclose.

VI. REBUS, by Mr. J. Stuckfield.

TO the chief Part of Jacob, add Part of a Swine,
And a Town's Name you'll see, where the Prospect is fine.

VII. A magical REBUS, by Mr. J. Bayley, of Middleton, Yorkshire.

TO four Sixths of a Bird, that sings once a Year,
Join the Half of Old-Nic, and a Sprite will appear;
A Longitude-Sprite, that appears among Witches,
And seen with a Lady that wears the big Branches;
A Lady and Witch, when undress'd and in Feathers,
Careless'd and admir'd by the Longitude-Brothers;
Of Titles renown'd, enough to excite ye;
The Sophys of Persia not more can invite ye:

THE BRITISH PALLADIUM; OR

You may conjure *this* Witch by a *Key* and the *Bible*;
But the *Masculine* Sprite is best charm'd with a *Libel*.*

* *The Encourager, Receiver, and Disposer of stolen Goods is equally criminal with the Thief.*

VIII. REBUS, *by a Highland Gentleman.*

WHAT's wore on the *Head*, and where Heroes are slain,
Will tell you the *Fair* that I wish to obtain.

IX. REBUS, *by a Drummer.*

JOIN what *Sopby* loves to five Fourths of a *Yard*, * In *Scotland*,
And 'twill shew you a *Place* * where I have mounted Guard.

X. REBUS, *by Miss Sally Hill, of Hill, near Gibside, Newcastle.*

JOIN the *first* of a *Nymph* to *three Fifths* of a *Swain*,
And a *beautiful Bird* you will see very plain.

XI. REBUS, *by Miss Sally Hill, of Gibside.*

THE *first* of *Good-Nature*, and next *Half* to that,
What tickles and teazes, will tell very pat.

XII. REBUS, *by Mr. Michael Taylor.*

TO the least among *Dwellings*, a heavy *Weight* add,
And a *Name*, much admir'd among the *Ladies*, is had.

NEW PARADOXES.

By Paradoxes you surprise,

And useful Truths discern from Lies.

I. PARADOX, *by Mr. W. Wilson, of Norwich.*

A *Cone* of *Gold* one did behold,

Who did presume to say,

When on its *Base* he that did place,

A *hundred Tons* did weigh :

But, when *inverted*, he asserted,

Tons ninety-nine its *Weight*.

Then let us see how this can be,

And tell the *Cone's* true *Height*.

II. PARADOX, *by the Rev. Thomas Vaughan, A. M. of Morpeth.*

I'm a *Word* of *six Letters*, just *Syllables two* ;

I'm the same when read *backward* or *forward* by you :

Take *two Letters* from me, read which *Way* you will,

I'm the same, and a *Word* of *two Syllables* still.

III. PARADOX, *by Mr. R. C. of the Isle of Wight.*

A *Man*, in the *Isle* of *Wight*, rode 670 *Miles* in an *Hour*.

IV. A *geometrical PARADOX*, *by Mr. John Simmons, jun. of Mr. Orchard's School, Gosport, Hampshire.*

FROM one *Square Window's Space* another frame,
Just *half* as big ; both *Heights* and *Breadths* the same.

NEW QUESTIONS.

Questions are made to exercise your Parts,

In ev'ry Branch of mathematic Arts ;

Propos'd in Rhime, or not, is not the Thing ;

Each Question should its Use or Pleasure bring.

For Use and Fancy use our Lives, live a'or,

For Practice much, for Speculation more ;

And diff'rent Tastes with diff'rent Likings suit ;

All Men are born in Liking absolute.

I. QUESTION 471, *by the Palladium-Author, jun.*

A *Number* of *Seamen*, in the last War, received 275*l.* 3*s.* 6*d.* $\frac{1}{2}$, *Prize-Money*, (each receiving alike to a *Farthing*) ; what did each *Man* receive ? and what was the *Number* of *Seamen* ?

II. QUESTION 451, by Miss Polly Sqw.

A Gentleman bought an Estate for a certain Number of different Pieces of Money, (*viz.* Guineas, Half-Guineas, Quarter-Guineas, Half-Crowns, Shillings, and Sixpences,) contained in 6 separate Bags; and the *Pieces* of the greater Value contained in a Bag having the *less* Number of them: The Number of Pieces in each Bag, being multiplied together, produced 118,243,529,689,909,193 (18 Figures). What Number of Pieces, did each Bag contain, and how much did the Estate cost?

Note, *The Number of all the different Pieces, in one Sum, was equal to 4418.*

III. QUESTION 473, by Miss Sally Hill, of Hill.

BEING asked, by a Gentleman, the Time of the Day, looking on the Clock, I answered him, it was between 10 and 11; and that the Hour and Minute Hands of the Clock were *exactly* together. What Time was it, by a short and general Rule?

IV. QUESTION 474, by Mr. John Simmons, jun. of Mr. Orchard's School.

A Cock, A, being set open, will fill a Reservoir of Water, by itself, in 6 Hours; a Cock, B, by itself, in 8 Hours; and a Cock, C, by itself, in 10 Hours: If all which Cocks are shut, and the Reservoir is full, a Cock, D, being set open, will, by itself, empty the Reservoir in 9 Hours; a Cock, E, by itself, in 11; and a Cock, F, by itself, in 13. In what Time will the empty Reservoir be full, when all the Cocks, A, B, C, D, E, F, are set open together? — by a short and general Method.

V. QUESTION 475, by Mr. John Scott, of Cawthorne.

A Gentleman bought a Ring of fine Gold, which cost 1*l.* 1*s.* 1*d.* 3, at the Rate of 4*l.* an Ounce; the Thickness of the Ring, when added to its outward Circumference, = 2.8 Inches: Required the Dimensions of this Ring.

VI. QUESTION 477, by Mr. T. Sadler, of Whitchurch, Shropshire.

LATELY lost, by a Lady, what may be found from the following Equations.*

$$\left. \begin{array}{l} *w + w + x + y + z = 106 \\ w + w + x + y + z = 70 \\ w + w + x + y + z = 50 \\ w + w + x + y + z = 322 \\ w + w + x + y + z = 392 \end{array} \right\} \begin{array}{l} \text{Required the Numbers answering to } w, \\ w, x, y, \text{ and } z, \text{ signifying the Numbers} \\ \text{of the Places of the respective Letters they} \\ \text{represent, in the Alphabet; and thence to} \\ \text{find the Word they compose.} \end{array}$$

VII. QUESTION 478, by Mr. Sadler.

From these Equations, here in View,†

Ye Analysts, declare,

What Sophia † did consent to do,

To ease her Hormer's Care?

& One of her Lovers.

† The genuine Love-Letters of this enamoured Lady, in her own Hand-Writing, (incomparable Italian,) are deposited in the Palladium-Author's Possession.

$$\left. \begin{array}{l} \dagger x + yz = 41 \\ y + xz = 89 \\ x + xy = 109 \end{array} \right\} \begin{array}{l} \text{Where } x, y, z, \text{ represent} \\ \text{the No of the Places of} \\ \text{the Letters in Alphabet} \\ \text{composing the Word.} \end{array}$$

VII. QUESTION 478, by Mess. J. B. L. and Sedgwick, of Cottingham-School.

$$\frac{\sqrt{x^3} - \sqrt[3]{x^4}}{\sqrt[3]{x}} = x. \text{ Required the Value of } x.$$

VIII. QUESTION 479, by Mr. John Simmons, jun. of Mr. Orchard's School.

TO divide a hundred Guineas betwixt 4 Persons, so that one Part being increased by 5, another Part diminished by 5, another Part multiplied by 5, and a fourth divided by 5, the Sum, Difference, Product, and Quotient, shall all be *exactly* equal.

IX. QUESTION 480, by Miss Sally Hill, of Gibside.

A Merchant exchanged 20 French Crowns, 12 Dollars, and 10 Ducats, for 30 Guineas, English; next he exchanged 24 French Crowns, 16 Dollars, and

 We acknowledge the Receipt of other useful or curious Questions from several of our ingenious Correspondents; but, as our Rule is to select the most curious, practical, and useful, (besides new,) out of the many Questions sent, our Correspondents will see some of their Questions inserted and some omitted, since Room cannot be found for all. — Mr. Edward Johnson, of Hull, formerly a Teacher of the Sciences, but now a Land-Surveyor, versed in all Parts of the Mathematics, has favoured us with easy, general, and elegant, Constructions (besides curious analytical Solutions) to the Questions inserted in his Name, and others we had not Room for this Year. — Capt. Edward Williams and Lieut. Jardine, both of the Artillery, at Woolwich, have sent us Solutions and Constructions (which we reserve) to the Questions inserted in their Names.

Capt. Williams has sent us the following Solution to the following Observations, taken by him, at Sea, on Board the Sybilla Ordnance-Transport, June 23, 1772.

$$\begin{array}{l} \text{At } 8^h 54^m \text{ } \odot \text{'s Alt. } \left\{ \begin{array}{l} 48^{\circ} 42' = 1^{\text{st}} \text{ Alt.} \\ 9 \ 46 \text{ } \left\{ \text{Cont. } \left\{ \begin{array}{l} 55 \ 48 = 2^{\text{d}} \text{ Alt.} \end{array} \right. \right. \end{array} \right. \text{ Compts } \left\{ \begin{array}{l} 41^{\circ} 18' \\ 34 \ 12 \end{array} \right. \left. \begin{array}{l} \text{Sun} = 75^{\circ} 30' \\ 2A = 11 \ 56 \end{array} \right. \end{array}$$

Fr. Operation below.*

$$\begin{array}{l} \text{Sum} = 87^{\circ} 26' \quad \left\{ \text{Comp. 2d Alt. } 34^{\circ} 12' \right\} \quad \text{Sum} = 46^{\circ} 8' \quad \left\{ \text{Diff. } 4^{\circ} 50' \right. \\ \left. \begin{array}{l} \text{Sum} = 43 \ 43 = S \\ \quad \quad \quad 2A = 11 \ 56 \end{array} \right\} \quad \left\{ \text{Cos. 1. Alt. } 41 \ 18 \right\} \quad \left\{ \frac{1}{2} \text{ Diff. } 2 \ 25 = D. \right. \end{array}$$

Log.

$$\begin{array}{l} \text{Cos. Decl. } 23^{\circ} 29' \dots 9.9624527 \\ \text{Sine } \frac{1}{2} \text{ Time } 6 \ 30 \dots 9.0538588 \end{array}$$

$$\begin{array}{l} 2C = 119^{\circ} 54' \\ B = 87 \ 24 \end{array}$$

$$\begin{array}{l} \text{Sine Arc } A = 5 \ 28 \dots 9.0163115 \\ * 2A = 11 \ 56 \end{array}$$

$$\begin{array}{l} \text{Cos. Diff. } 32 \ 30 \dots 9.9260293 \\ \text{Cos. 2d Alt.} \dots 9.8322529 \end{array}$$

$$\begin{array}{l} \text{Tang. } \frac{1}{2} \text{ Time} \dots 9.0566595 \\ \text{Sine Declin.} \dots 9.6004090 \end{array}$$

$$\text{Tan. Arc } E = 29^{\circ} 49' \dots 9.7582821$$

$$\text{Cos. Arc } B = 87^{\circ} 24' \dots 8.6570685$$

$$\begin{array}{l} \text{Cos. Declin. } 66 \ 31 \\ E = 29 \ 49 \end{array}$$

$$\begin{array}{l} \text{Sine } S \dots 9.8395363 \\ D \dots 8.6249653 \end{array}$$

$$\begin{array}{l} \text{Cos. Diff.} = 36 \ 42 \dots 9.9040529 \\ \text{Sine 2d Alt.} \dots 9.9175478 \end{array}$$

$$\text{Co. Ar. } \left\{ \begin{array}{l} \text{Sine } 2A \dots 0.6845053 \\ \text{2d Alt.} \dots 0.2507993 \end{array} \right.$$

$$\text{Cos. } E \dots \text{Co. Ar.} \dots 0.0616700$$

$$\text{Sine Lat.} = 49^{\circ} 51' \dots 9.8832707$$

$$\begin{array}{l} 2) 19.3992062 \\ \text{Cos. Arc } C = 59^{\circ} 57' \dots 9.6996031 \end{array}$$

Note. The Haze clearing up, about $10^h 34^m$, we made the Start Point, bearing N. N. E. and thereby confirmed the Latitude determined by the foregoing Observation. These are all the Figures necessary to make this easy Computation; whereas the indirect Method [in the Naut. Ephem.] requires a more tedious Operation; and, after all, produces only an uncertain Result; so that it is surprising how any Judge of the Subject could adopt one Method and reject the other.

EDWARD WILLIAMS.

Remark by the Palladium-Author. The indirect and erroneous Method of determining the same (adopted by Mr. Maskelyne) was borrowed from a Dutch Pretender to Calculation, (Cornelis Doves of Amsterdam,) first attacked upon the Public by Mr. Harrison of Whitehaven, by the Title of Solar Tables; then adopted, with some trifling Alterations, by Mr. Maskelyne in the Nautical Ephemeris, and, lastly, fresh imported from America, with Things true mixed with Things inconsistent, by N. D. Falck, a fresh Advocate for Error, in a Quarto Pamphlet, intitled the Ready Observer, or an infallible Method for determining the Latitude at Sea, by Altitudes of the Sun, at any Time [viz. any one Time] of the Day, either Forenoon, or Afternoon, independent of a meridional Observation; (so fond are some of following a new Track, whithersoever it leads.)

But

But as the Safety of Ships and Lives depends on a Method of Practice, founded on true Principles, all other Methods are but specious, (however recommended,) and are justly to be rejected (with their Author) as *unworthy to be trusted*.

The PALLADIUM-SOCIETY. UTRIUSQUE MINERÆ.

Armorum et Artium Amatores.

1. IT is proposed, for the Promotion of *Literature, Arts, and Sciences*, in their most useful Branches, both in *Theory and Practice*, that a Number of *Palladium* Correspondents, and other Lovers of *Arts and Arms*, and literary Improvements, form themselves into a *select Body of honourable Institution*, for public and private Utility, intitled *The PALLADIUM-SOCIETY*: By the Diligence, Application, and Ingenuity, of whose several *respectable Members*, it is hoped that every useful Branch of *Literature and Science* will be improved in the *BRITISH PALLADIUM or Annual MISCELLANY*, and its *CONNEXION*.

2. Whatever Improvements made, there is not Room for in the *principal and original Palladium*, (to be published at the usual Season,) are to be afterwards published, about the Beginning of each *new Year*, in another Work, (*Price 1s.*) intitled *The Supplemental PALLADIUM*; to contain, with the *principal Palladium*, all the *Matters and Transactions* of the *Palladium-Society* to *Midsummer*, each Year: After which Season there will be Time little enough to compile, print, and publish, both Works, as proposed.

3. Each Member of the *Palladium-Society* to subscribe, *at least*, for 6 *British Palladiums*, yearly, to the *Publisher*, in *London*, at the Price of 4s. 6d. only (the Price to Booksellers) to each Member, for promoting the Sale thereof, and for the Propagation of *Literature and Science* in general, so as to answer the Purpose of the *Bookseller, Author, and Correspondent*. And that no Member may sustain a Loss, by the Number of *Palladiums* he subscribes for, he may engage a Number of his Friends and Neighbours to take as many off his Hands, for 1s. each, (the common Price,) as he has no Occasion for himself, or does not make Presents of to Friends. And as some Members may have Occasion to subscribe for more than Others, 12, 18, 24, &c. each Member will have his Name recorded, mentioning the Number of *Palladiums* he subscribed for to the *Publisher* in *London*, with his particular Place of Abode and Station in Life if he pleases, and the Time of his Creation, in an alphabetical List of the said Members, that each Member may be distinguished for his Degree of Merit in the Encouragement of *Literature and Science*.

4. At the Meeting of the *Palladium-Members*, to transact Business, in any Place or Town of the *British Dominions*, the *senior Member* by his *Date of Creation*, shall take the *Chair*, or upper Hand of all the Rest of the *Members* present.

5. Each Member to be distinguished by wearing a *gilt Button* on his Hat, impressed with the Device of a *Laurel, Helmet, and Plume*, and the Letters, A. A. A. (*Armorum et Artium Amator*), on its polished Surface; to be received in *London* by the *Palladium-Author's* Order; the newly-instituted Member paying 1s. for the same to the Deliverer.

6. Each Member to be free to continue or cease being a Member at *Pleasure*, on Notice given to the *Palladium-Author*, that his Name may be removed from the List, and due Honours paid to his *past Services*.

7. No Restraints to be upon, or Secrets kept by, any Member: Who are each, in their Conversations and Relations concerning their Improvements, to be free, like *free Men of Honour*, and not like *free Masons*.

8. Every Member to be made at a Meeting, in the Presence of two *Certifiers or Witnesses* at least, by a *Laurel* imposed on his Hat, standing upright, and holding a drawn Sword in his right Hand, with the Blade laid across his left Arm and the Point elevated, while he declares aloud, *Armorum et Artium Amator sum*: Which being reported to the *Palladium-Author*, who is *Secretary*, (Mr. Emerson,

THE BRITISH PALLADIUM.

or any Person of his Appointment, for the Time being, being *Prophet*, &c. *Bottom*, for the new Member's Hat, will be immediately ordered him, to wear at the Times of meeting any of the Members, or at any Time when he pleases.

9. Those, who choose to become *Members* of this honourable Institution, are desired to send their Names and Places of Abode, signed by two Witnesses, to the *Palladium-Author*, at the usual Place.

N. B. Other Regulations of the Palladium-Society will be sent hereafter.

On the late celebrated *Astronomer-Royal*, Dr. EDMUND HALLY, who was not only an accurate and judicious Observer, (not a mere Observer,) but an excellent *Astronomer and Mathematician*. By PHIL-EXCELLENCE.

THE gracious CAROLINEth his Merit saw, *The late Q. Caroline*
With whom no Age his Parallel could draw;
In Mind *seraphic*, as in Spirit free,
Propos'd his Stipend should augmented be.
The Doctor prudent, as the Queen was good,
Said, Gracious Madam, 'tis not fit it should;
The Pay enlarg'd will serve some Member's Use,
And the Design be turn'd into Abuse:
No Laurels by Astronomers be won.
She smil'd, propitious, *Doctor, I have done*.
Has Hally's Prophecy not prov'd the same?
For what are *some Successors* but a Name?

A SMILE, by *Asperpousus*. Occasioned by the Instruments of an Observatory being taken to Pieces, which could not be put together again, without the Help of an able *Instrument-Maker*.

THE naughty Boy, who seldom says his *Pray'rs*,
To shun his Task, his Book in Pieces tears!
Is it for this his Friends his Earning pay,
Who, 'stead of being Audious, loves to play?
Was it for this to Cambridge he was sent,
And so much Money at *Exation* spent?
Is this your Duty? *Naughty Boy, O fie!*
Borrow a Book — or else another buy.

The PRIZES won. Mr. Judson is desired to send an Order to Mr. Cole's for *Photopact*, for 12 *Prize-Question Palladiums*, his just Claim and Reward. The Rev. Mr. Kaughan an Order for 4 *Prize-Enigma Palladiums*, his Due, by Lot. Mr. Bearn for 3 *Prize-Enigma Palladiums*, and also Mr. Gumbly for 3 *Prize-Enigma Palladiums*; (these 6 respectfully presented to those ingenious Correspondents, for their Industry and Merit, by Miss Stow, being the 6 she won by Lot; an Offer of her Good-Nature.) Mr. Coaghen is desired to send for 4 *Palladiums*, and Mr. Rowe for 3 *Palladiums*, *Donum Auctoris*, for their Criticisms and Corrections; a good Task. All Orders to be in their own Hand-writing to Mr. Cole; and the Receipt of their Orders to be acknowledged in their next Correspondence.

☞ We received no extraordinary Exploits, performed this Year, worthy Promotion in the lunar Regions; which Promotions, till next Year, must therefore remain as they did. One of our young Correspondents, indeed, gave us an Account of Myr-heer Snip, or Mr. Buggurbo Sack, who performed Wonders in Portsmouth Streets, walking up and down in a Sack, both in the Day and Night Time, and frightening the Boys and pretty young Women with his Apparition! Who may be farther considered, if he continues to play his Tricks, and give out Nick-Names from his Sack. — The Genealogy of a Witch of Longitude, and a Latitude Necromancer, and other Accounts of Prodiges hereafter.

T H E E N D,

THE
BRITISH PALLADIUM:
OR,

Annual Miscellany of Literature and Science:

For the YEAR 1774.

In TWO PARTS.

The *First* containing *new, general, and select, SUBJECTS*: With an *Alphabetical CHRONICLE* (Number III.) of remarkable Events; and *SHORT GRAMMATICAL TABLES* of the *Terminations* of the *Latin Verbs*, (through all the *Moods* and *Tenses* of the 4 *CONJUGATIONS*, *methodized* and *exemplified* for the *most Ease* to the *Memory*: Making the *most difficult Part* of *LATIN GRAMMAR* the *most easy*.
The *Second* comprehending *Answers* to former *Enquiries*: With a *Variety* of *new and entertaining Things* proposed.

Serving for Land and Sea.

The *Twenty-sixth* Number published.

With which may be had, (*just published*, that should have been published with last Year's *Palladium*,) *The Practical Arithmetician, or Art of Numbers improved*: Being a Set of *new, short, practical, and mechanical. Rules*, in all the Branches of *Arithmetic*, (*perfected* without an *Appendix*,) for exercising, with *Readiness and Facility*, all Parts of the *arithmetical Art*: *Serving for Schools and private Tutors*.

Also *The Seaman's Guide*, (*just published*,) or *Key to the Nautical Ephemerides*, for keeping a *Reckoning of Longitude*, from *Observation*, on Board his Majesty's Ships at Sea, as far as is *practical*. (According to the *Method* borrowed from the *French* by our Reverend *Conductor* of the *Longitude*).

By the AUTHOR of the *Improved Royal Astronomer and Navigator*.



As Bees extract the *Sweets* from every *Flow'r*,
So should the *Sons of Science* spend each *Hour*;
Ga her from all the *Branches* in *Esteem*,
And be acquainted with each *useful Theme*. *Perseverator*.

LONDON: Printed for D. STEEL, Number 1, *Union Road*, the lower End of the *Minories*, *Little-Tower Hill*. 1774. Price One Shilling.

To the PALLADIUM-AUTHOR.

SIR.

THE following is an Account of an original Author, whose Genius has appeared, with a bloody Knife in its Hand and a Steel by its Side, to all the Palladium Correspondents in the Country, not a little dismayful and startling to Many, though not so to, Sir, your humble Servant and constant Reader,

CLERICUS, M. A.

The TALL BLOODY BUTCHER, and the LITTLE BLACK MAN!

In nova fert Animus mutatas dicere Formas. Ovid. Met. l. 2.

THE bloody Butcher on the Shelf
Of NATURE lay, neglected Delft;
Dame Nature, did the Foreman say,
What shall we make of this coarse Clay?
For 'tis too dull and unrefin'd
An Outside for a thinking Mind.
When Madam Nature with a gruff
Disdainful Leer beheld the Stuff;
Then smil'd, and said, 'tis coarse and stubbish,
Yet we'll make *Somewhat* of the Rubbish.
We us'd to sport in making Monsters,
We'll make a Savage up with long Ears;
His barren Brains and Want of Sense
Supply with matchless Impudence!
We'll make him neither Mule nor Ass,
But Russian tall, with Front of Brass!
With Mind *unfeeling* as the Rocks,
And Body to endure *hard Knocks*;
Not prone to any Kind of Good,
But made to serve for *shedding Blood*!
Yet Steel or Balls shall shake his Soul,
And make him sneak into a Hole!
Accordingly they in a Trice
Form'd him fit *Implement* for Vice.
Then Fire from *Ætna* fetch'd straitway
To animate this stubborn Clay.
This Russian was no sooner made
Than he began the *rhiming Trade*;
At the Palladium he let fly,
As if he meant to storm the Sky;
And aim'd a Shaft at *Polly Stow*,
But, wanting Wit, he sunk below;
Obscenity he ply'd amain,
But *impotently* strove in vain;
Then Calumny and Scandal tries,
And has Recourse to *barbac'd L -s*;
But all these Tricks would not avail him,
His other *Deeds* in *Newgate** jail him.
He ran away,† but is stop't short,
And you will find him next at Court; ¶
If there you miss him — please to call
At *Triangular Town*|| or *Surgeons Hall*.‡

Tradition

* A Palace in London for the Meritorious.

† Was concealed at Greenwich; a Star-gazing Town. ¶ The Old-Bailey.

|| Paddington; a mathematical Town. ‡ In the Old-Bailey.

Tradition gives us this Relation
 Of one unborn to Reputation ;
 We're told how, on a dismal Night,
 There stood presented to his Sight
 (Or seem'd to stand) a small black Man !
 With Hoofs and Horns, and Visage wan,
 Who (as a Witch glides through a Hole)
 Into his inmost Chambers stole,
 And with his Conscience sneak'd away,
 Which he detains unto this Day.
 If any Man will undertake
 To catch the Thief, and bring him back ;
 Detect him, cause him to restore it,
 The Butcher will reward him for it.

To the PALLADIUM-AUTHOR.

SIR, If the following Observations are worthy of your Notice, I shall be glad to see them published in your useful Palladium. Who am, Sir,
 On-board the Cambridge, Your most humble Servant,
 July 1, 1773. A SEA-OFFICER.

A COMPARISON of the NAUTICAL EPHEMERIS, 1774, for Greenwich, with the CONNOISSANCE DES TEMPS, 1774, for Paris.

Or, the DISCOVERERS of the LONGITUDE discovered.

NOTWITHSTANDING the great Expence this Nation has been at for Mayer's solar and lunar Tables, (which cost 3000*l*.) and paying several annual Salaries to Computers, for using them, and executing the Office of Astronomer Royal, with other attending Expences for carrying a Nautical Ephemeris (for discovering the Longitude at Sea by Observation) into due Execution, it is seen, that great, if not the greater, Part of the British Nautical Ephemeris, 1774, for Greenwich Meridian, commanded to be used in the Navy, exactly corresponds with the same Kind of Computations in the Connoissance des Temps, 1774, for the Meridian of Paris, published before the said Ephemeris.

The Lunations for Greenwich from which Aid might be expected in the Oppositions for ascertaining the Longitude at Sea) exactly correspond with those in the Connoissance des Temps for Paris, when g^m are taken from the Times of the Paris Lunations. But the Greenwich Lunations should be computed by Mayer's Tables, purchased by our Government partly for that Use, yet are borrowed from the Paris Lunations, (calculated by De la Caille's or other Tables, not Mayer's,) as it cannot be supposed that the French Calculations, first published, were borrowed from ours.

This Misuse of the Money, advanced by our Government for making our own Calculations by Mayer's purchased Tables, is farther manifested in the Times of the Eclipses of the 4 Satellites of Jupiter, in the Nautical Ephemeris, 1774, for Greenwich, corresponding with the Times of those Eclipses for Paris exactly ; when g^m 16^s are abated from the Times of the latter for those of the former. And the Configurations of these 4 Satellites, for each Day of the Year, in the Nautical Ephemeris, and those in the Connoissance des Temps, are seen to be exactly the same for the Meridians of Greenwich and Paris.

The Times of the Moon's Passages by both those Meridians, the Moon's Declinations and horizontal Parallaxes, (and consequently Diameters,) at Noon, are exactly the same in both those Productions, one being a direct Copy from the other without the least Variation ; notwithstanding the Difference of the two Meridians ; and the different Tables they are supposed to be computed by. Yet the

THE BRITISH PALLADIUM, OR

Moon's Latitudes at Noon, Places, and Right-Ascensions, widely differ in both those Performances. Which Paradox refers to the English Calculators to resolve.

The two Eclipses of the Sun in the *Nautical Ephemeris*, for *Greenwich*, agree with the Times of those Eclipses in the *Connoissance des Temps*, for *Paris*, (except by an exceedingly small, supposed to be made, Difference,) when $9^m\ 16^s$ are abated from the *Paris* for the *Greenwich* Times, at the same Instant, (the Difference of Meridians,) and about $180^\circ\ 15'$ abated from the *Ferro* Longitude at *Paris*, for the Longitude from *Greenwich*, where the same Phenomena are said to happen.

The Distances of the Moon's Center from the Sun's Center, and also fixed Stars, are printed exactly the same in both Performances, for both Meridians, *Greenwich* and *Paris*. But, in the *Nautical Ephemeris*, the Stars are called by their proper Names, which, in the *Connoissance des Temps*, have only referential Greek Characters to distinguish them. This is another Paradox referring to the English Longitude-Schemers for Solution: How the same Phenomena should appear, at the same Time, reckoned under two distant Meridians, $20^\circ\ 20'$, or $9^m\ 20^s$ in Time, asunder, according to Dr. Halley; or more or less, according to the *Moonrasi Hair-Splitters*, English and French Refiners.

It surely will not be objected, as a Defence for the English Calculators, that the French Computers have borrowed their Calculations from ours, when the industrious Academicians have generally produced their Calculations, for Time forward, before ours. And then a Question will follow to be answered, which of the two Parties, entrusted with a public Charge for duly executing, have acted with the most Fidelity and Honour to their respective Country. And surely it will not be urged that both Parties of Calculators have been in Conspiracy against the Honour of their own Country.

The British Computers make as puzzling a Mystery of their mixed and borrowed Calculations (and some of no Use at Sea) as of the Longitude they seek. But we, on-board the Navy, make the same Use of the *Nautical Ephemeris* as we do of a Pack of Cards or the Back-gammon Tables; to pass an idle Hour or to kill Time. For, as we find none is paid for chasing the Longitude-Prize but Longitude Schemers and Projectors, (for whose Profit we are annually out of Pocket by being compelled to buy their Work,) we have long given over the Chace ourselves, without endeavouring to come up with what is not worth our picking up.

In the Preface to the *Nautical Ephemeris* for 1774, the reverend Superintendent or Commander in Chief of Longitude, thinking the Reputation of his wonderful Work diminished or less esteemed than it deserves, (wherein are Calculations and Crotchets not wanted at Sea,) has begun and continued a modest Dispute, for two Years together, with Mr. Bernouilli. (a young and eminent Astronomer to his Prussian Majesty,) to settle the Importance of his *Nautical Ephemeris*. It is about the Trifle of $13''$ Difference between the solar Places, observed in Mr. Bernouilli's *Recueil pour les Astronomes*, as calculated by De la Caille's Tables, and the Superintendent of Longitude's Places, calculated by Mr. Mayer's Tables; to the former of which Tables the Preference is given. But, as Mr. Bernouilli is denied the Liberty of a harmful Observation, (without a Condescension and Acknowledgement demanded for it,) he will surely preserve his esteemed Talents and polite Spirit for a better Use than to gratify so peremptory a Demand, made in the Face of the Public. This Gentleman might, with the same Propriety, demand of his Exalter, to make a Sermon upon Liberty and Tom Paine,* and preach it publicly.

Whereas, every Month's Calculations of the solar Places in the *Nautical Ephemeris* are seen to differ more than $13''$ from the solar Places in foreign Ephemerides, when the Difference of Meridians, in mean Motion, is allowed; viz. $23''$ to be added to the *Paris* for the *Greenwich* solar Places. Or $5^l\ 5''$ to be added to the *Paris* for the *Greenwich* lunar Places, at Noon; allowing $9^m\ 16^s$ only, Difference of Meridians, in Time. — The Planets Places, in the *Nautical Ephemeris*, differ not so exactly regular from those in the *Con. des Temps*, as the other Calculations differ, for determining how far they are borrowed.

A NEW
* Name of a pious Sea-Captain; one of whom preached in Sisson's Cole-hole, Strand.

ANNUAL MISCELLANY, 1774.

A NEW GUIDE to the YEAR 1774.

P A R T I.

To find the Day of the Month from the Day of the Week, and Day of the Week from the Month-Day.

Against each Month of the Year, to the Right-hand, stand the Seven Week-Days, above which stand all the Month-Days in that Month, answering to each Week-Day.		MONTH DAYS and WEEK-DAYS.						
		1	2	3	4	5	6	7
		8	9	10	11	12	13	14
		15	16	17	18	19	20	21
		22	23	24	25	26	27	28
		29	30	31				
MONTHS of the YEAR.		29	30	31				
January. October.		Sa	Su	Mo	Tu	We	Th	Fr
February. March. November.		Tu	We	Th	Fr	Sa	Su	Mo
April. July.		Fr	Sa	Su	Mo	Tu	We	Th
May.		Su	Mo	Tu	We	Th	Fr	Sa
June.		We	Th	Fr	Sa	Su	Mo	Tu
August.		Mo	Tu	We	Th	Fr	Sa	Su
September. December.		Th	Fr	Sa	Su	Mo	Tu	We

For Construction of the above Table, *See P. 2, Palladium, 1763.*

EXAMPLE I. *To find the Day of the Month answering to the third Sunday in March, 1774.*

To the Right-hand of *March* you find *Su*, or *Sunday*; directly above which, in the Columns among the Month-Days, stand 6, 13, 20, 27, answering to all the *Sundays* in *March*: Therefore the third *Sunday* is the 20th Day, required. So for other like Cases.

EXAMPLE II. *To find the Day of the Week on which the 29th of September or Michaelmas-day, happens, 1774.*

Under 29, the Month-Day, against *September*, at the Angle where the upper and Side Columns meet, stands *Th*, or *Thursday*, required.

NOTES for 1773.		Moveable FEASTS.		SUN rises.				
				Mths.	1st	11th	21st	Examples.
Optm. Let. N.S.	B	Jan. 30.	Septuages.					
— O. S.	E	Feb. 16.	Ash-Wed.					
Golden Number	8	20.	1st Sund. Lent		h m	h m	h m	Against Ma
Epact (or D's Age at		Apr. 3.	East. Sund.	Jan.	8 57	58 7	45	the Sun rise
Year's Beginning)	17	May 8.	Rog. Sund.	Feb.	7 22	7 6	30	h n
Sun's Cycle	19	12.	Ascension	Mar.	6 32	6 12	5	1st 4 3
Roman Indiction	7	22.	Whit Sunday	April	5 31	5 14	53	11th 4 2
Era Jul. Pe. 7a. 6487		29.	Trin. Sund.	May	4 35	4 20	4	21st 4 .
— Olymps Jul. 255		Nov. 27.	Advent Sun.	June	3 51	3 45	3 43	Dif. 15 ^m i
— Found. Ro. 2527			Ember-Days.	July	3 46	3 54	4 .	24 Hours, &
— Nabonassar Fe 2521		Feb. 23, 25, 26.		Aug.	4 20	4 36	4 54	16 ^m less fo
— Hegira July 1153		May 25, 27, 28.		Sep.	5 15	5 32	5 54	10Ds. or 1m
Greg. Era 68192		Sep. 21, 23, 24.		Oct.	6 13	6 33	6 35	a Day nearly
Yrs completed at th.		Dec. 14, 16, 17.		Nov.	7 12	7 30	7 45	N. B. Sun
Mths. O. S. Olymp. 2				Dec.	7 58	8 6	8 .	rising sub.
Yrs more than by de la								from 12 ^h
Land's. See Axioms &								gives Sun-
Rules, p. 351, R. Afr.								setting.

N. B. The complete Years of the several Eras end at the Month, then the next Years take Place; each for a Year following.

Astronomical

THE BRITISH PALLADIUM, OR

Astronomical MOONS for Greenwich-Observatory, 1774.

Last Quarter.			New Moon.			First Quarter.			Full Moon.		
Mths.	d	h m	d	h m		d	h m		d	h m	
Jan.	5	5 40 A	—	12	8 45 M	—	19	3 11 A	—	27	6 48 A
Feb.	4	2 56 M	—	10	8 38 ⁽³⁹⁾ A	—	17 ⁽¹⁸⁾	11 55 M	—	26	10 30 M
Mar.	5	10 21 M	—	12	9 55 M	—	20	8 31 M	—	27	11 28 A
Apr.	3	4 58 A	—	11	0 19 M	—	19	3 14 M	—	26	9 34 M
May	2	11 58 A	—	10	3 16 A	—	18	6 58 A	—	25	5 22 A
June	1	8 23 M	—	9	6 20 M	—	17	7 20 M	—	23	11 57 A
	30	6 59 A	[N. B. M stands for Morning and A for Afternoon.]								
July	30	8 17 M	—	8	9 17 A	—	16	4 36 A	—	23	6 41 M
Aug.	29	0 26 M	—	6 ⁽⁷⁾	11 56 A (M)	—	14	11 35 A	—	21	2 51 A
Sep.	27	7 4 A	—	6	1 59 M	—	13	5 27 M	—	20	1 17 M
Oct.	27	3 8 A	—	5	3 0 A	—	12	11 33 M	—	19	2 27 A
Nov.	26	10 58 M	—	4	2 51 M	—	10	7 7 A	—	18	6 16 M
Dec.	26	4 43 M	—	3	1 44 A	—	10	5 5 M	—	18	0 16 M

* Time by Con. des Temps, () by Naut. Eph. Dif. 12^h by copying wrong here.

Add to the Month-day for the Moon's Age.		New D.	Sun and Moon's Place at New Moon.		Sun enters Signs.	Sub. and add from and to D's Southing for her Rising & Setting.		To find the Tides at London.	
No.	d		s	o		D Place.	Arc ⁺ ±	Rule. Add 2 ^h 30 ^m to Time of D's Southg (fr. the Table of her Southing) for Time of High Water required	
Jan.	18	12	9	22	♈ 19	3 0	8 30	Ex. Jan. 26, 1774, D Southg. by Tab. follow	
Feb.	19	10	10	22	♉ 18	4 2	8 15	26 ^d 11 ^h 18 ^m	
Mar.	18	12	11	22	♊ 20	5 1	7 15	Add 2 30	
Apr.	19	11	0	22	♋ 20	6 0	6 15	H.W. 1 m 48	
May	19	10	1	20	♌ 21	7 11	5 15	Add 5 10	
June	21	9	2	19	♍ 21	8 10	4 15	L.W. 6 m 58	
July	21	8	3	16	♎ 22	9 0	4 0	at Lond. Bridge.	
Aug.	23	7	4	15	♏ 23	9 20	4 15	N.B. Time of H. & L.W. at Lond. serves for Boats and Vessels bound down & up the R. or fr. ab. & below Bridge, to Lond. respectly	
Sep.	24	5	5	13	♐ 23	10 29	5 15	Gen. Rule. Add the T. of H.W. at N. and Full D for any Place, accord to a Tide-Tab. to the Time of D's Southg, that Day, for H.W. at that Place.	
Oct.	25	5	6	12	♑ 23	0 0	6 15		
Nov.	26	4	7	12	♒ 22	0 29	7 15		
Dec.	26	3	8	11	♓ 21	1 28	8 15		

Here the Day of N. D. and No. added for the following Month make up the Days in the present Month.

Exam. Sep. N. D. 12, & Oct. 25, added = 30 Ds. in Sept. the present Month N. D. 12 & Ap. 16 added = 31 Ds. in Mar.

To find Moon's Age.

Ex. 1. May 20 Add No. 19 39 21 Ap. 20 8 Ds. & Degr. + 8

Moon's Age 10

Ex. 11. July 15 Add No. 21 36 Abate 29 Moon's Age 7 When D Age is above 29 or 30 Ds. sub. 29 or 30, as 1. & 2d Col. (ag^t Mth) are 29 or 30 To find Sun's Place. Sub. or add Deg. for Ds. bef. or aft. ☉. Enter as Sn. for his Place. Required Sun's Place for Apr. 30, 1774. 21 Ap. ☉'s Pl. 1st 20 8 Ds. & Degr. + 8 30 Ap. ☉'s Pl. 1 19 at Noon.

Reg. D Pl. Jan. 23. D's Age 11^d Past N. + 11 X 13^o 8 = 4^h 25^o D's Pl. at N. D. } 9 22 D Pl. Jan. } 2 17 23, Noon } A near Comput. only To find D's Rising & Setting. Jan. 23, 1774. D m. Pl. fr. ab. 2nd 17^o Arc⁺ corres + 8^h 21 D's So. 23^d D. 8 25 54 D rises 23^d 0 2 33 Sets 24th 5 m 15 N.B. Take the Arc⁺ nearest or proper to D's Place above.

L. W. 6 m 58 at Lond. Bridge. N.B. Time of H. & L.W. at Lond. serves for Boats and Vessels bound down & up the R. or fr. ab. & below Bridge, to Lond. respectly Gen. Rule. Add the T. of H.W. at N. and Full D for any Place, accord to a Tide-Tab. to the Time of D's Southg, that Day, for H.W. at that Place.

*N. B. The Festival marked * is preceded by a Vigil or Fast. If any of the Feast-days fall on a Monday, the Vigil or Fast-day must be kept on the Saturday before, and not on the Sunday, which is the greatest of Festivals.*

The Days having this Mark, †, against them are Holidays observed at the Excheques, Stamp-Office, Excise-Office, Custom-House, Bank, East-India, and South-sea House.

At the Custom-House there is no Holiday on Valentine, St. David, Shrove-Tuesday, Easter-Wednesday, St. Swithin, Lammas-day, Fire of London, or Holy-Rood.

††† The Offices are mentioned 'All but such and such,' after †, where no Holidays are kept, when they are kept in all the other Offices.

MEMORANDUMS for the YEAR.

JANUARY, XXXI DAYS.

- 1 Circumcision. †
- 2 2 Sunday after Christmas.
- 4 Sir Isaac Newton b. 1643, N.S.
- 6 Epiphany, or Twelfth-day. †
All but South-sea House.
- 8 Lucian.
- 9 1 Sunday after Epiphany.
- 13 Hilary Cam. Term begins.
- 14 Oxford Term begins.
- 15 Exchequer opens.
- 16 2 Sun. after Epiph.
- 17 Old 12th-day.
- 18 Prisca. Q. Cha. Birth-day kept. †
Russians at Portsmouth, on Friday, 1771.
- 20 Fabian. 1 Return.
- 21 Agnes.
- 22 Vincent.
- 23 3 Sunday after Epiphany.
- 24 Hilary Term begins.
- 25 Conversion of St. Paul. †
- 27 2 Return.
- 30 Septuages. Su. Cha. I. beheaded
1648-9, O.S. 12^m past One. †

FEBRUARY, XXVIII DAYS.

- 2 Purific. B. V. or Candlemas, †
- 3 Bishop Blaize. 3 Return.
- 5 Agatha.
- 6 Sexagesima Sunday.
- 9 4 Return.
- 10 Dies scholastica at Oxford.
- 12 Hilary Term ends.
- 13 Quinquagesima, or Shrove-Sund.
Valentine. † All but Stamp,
Custom, and South-sea House.
Shrove-Monday.
- 15 Shrove-Tuesday. †
All but the Custom-House.
- 16 Ash-Wed. 1st Day in Lent. †
- 17 Cambridge Commencement for
B. A. Day after Ash-Wednes.

MARCH, XXXI DAYS.

- 20 2 Sunday in Lent.
- 23, 25, 26, Ember-days.
- 24 St. Matthias. * †
- 27 2 Sunday in Lent.
- 28 Hare-hunting goes out.
- 1 St. David. Anniversary-Meeting of the Welch Society, who wear a Leek on this Day in Memory of a famous Victory gained over the Saxons. † All but the Stamp and Custom-H.
- 2 Chad. B.
- 6 3 Sunday in Lent.
- 7 Perpet. Mauric.
- 12 Gregory Mart.
- 13 4 Sunday in Lent. or Midlent-Su.
- 17 St. Patrick, Bishop of Ireland.
Cambridge latter Act, Thursday after the 4th Sunday in Lent.
- 18 Edward, K. of the W. Saxons.
- 19 Joseph.
- 20 5 Sunday in Lent.
Cuthbert. Equal Day and Night.
- 21 St. Benedict.
- 25 Annunciation of the V. Mary. *
LADY-DAY, 1st Quarter-D. †
- 26 Oxf. T. ends, Sat. bef. Palm-Sun.
- 27 6 Sunday in Lent, Palm-Sund.
- 31 Russians at Portsmouth, on Friday, 1769. Maundy-Thursd.
Sir I. Newton died, 1727, N.S.

APRIL, XXX DAYS.

- 1 Fool's-Cap Day; Hatton-Harry,
Exeter Jack, Leonard Label,
Mr. O Fagon, Sanguinarius,
Greenovenius, &c. Good Fri. †
- 3 EASTER. Su. Rd, Bp Chichester.
- 4 Easter-Monday. † St. Ambrose.
- 5 Easter-Tuesday. † Old Lady-d.
- 6 Easter-Wed. † All but Custom-h.
- 10 1 Sund. after Easter. Low-Sund.

THE BRITISH PALLADIUM, OR

- 13 Oxford and Camb. Terms begin
Wednesday after Low-Sunday.
- 15 Sun and Clocks together.
- 17 Sunday after Easter.
- 18 1 Return.
- 19 Alphege.
- 23 St. George. †
- 24 2 Sunday after Easter.
- 25 St. Mark † 1 Return.
- 27 Victory of Culloden.
- MAY, XXXI DAYS.**
- 1 4 Sunday after Easter.
St. Philip and St. James. †
- 2 3 Return. Westminster Election.
Day after 4th Sun. after Easter.
- 3 Invention of the Cross.
- 6 St. John ante Port. Lat.
- 8 5 Sun. aft. Easter, Rogation-Sun.
- 9 4 Ret. 9, 10, 11, Rogation-days.
- 12 Old May-day.
- Ascension-day, or Holy Thurs. †
- 13 5 Return.
- 15 Sun. aft. Ascension, or 6 S. af. East.
- 16 Term ends.
- 19 Dunstan. Q. Charlotte b. 1744.
Oxf. Ter. ends, Th. bef. Whit-Su.
- 22 **WHIT-SUNDAY.**
Princess Elizabeth born 1770.
- 23 Whit-Monday. †
- 24 Whit-Tuesday. †
- 25 Whit-Wednesday. † All but
the Custom-house.
- 25, 27, 28, Ember-days.
- 26 Augusine, 1st Abp. of Cant.
No Night, but all Twilight.
- 27 Venerable Bede.
- 29 **Trinity-Sunday.**
King Charles II.'s Nativity and
Rest. after 12 Yrs Exile.
- 30 1 Return.
- JUNE, XXX DAYS.**
- 1 Nicomedes. Oxford Term beg
- 3 Trin. Term begins.
- 4 King George III. born 1738. †
- 5 1 Sunday after Trinity. Boniface
Prince Ernest b. 1771.
- 6 2 Return.
- 10 Princess Amelia b. 1711. † All
but Excheq. and Custom-house.
- 11 St. Barnabus. †
- 12 2 Sunday after Trinity.
- 13 3 Return.
- 16 Sun and Clocks together.
- 17 St. Alban.
- 19 3 Sun. after Trin.

- 20 Transl. of Edw. K. W. Saxons.
4 Return.
- 22 Longest Day. Term ends.
- 24 ST. JOHN BAPTIST. † 2d
Quarter-day.
- 26 4 Sunday after Trinity.
- 29 St. Peter and Paul. †
Oxford Act, 7 Days bef. Cam-
bridge Commencement.
- 30 Buck-hunting comes in & con-
tinues till Holy-rood. Exeter &
Wadham Col. Elect. at Oxf.
- JULY, XXXI DAYS.**
- 2 Visitation of the B. V. Mary.
- 3 5 Sun. af. Trin. Dies Comitorum.
- 4 Translat. of St. Martin, Bishop.
- 5 Cambridge Commencement for
B. A. 1st Tuesday in July:
Old Midsummer-day.
- 7 Tho. à Becket, Church Tyrant.
- 8 Cambridge Term ends.
- 10 6 Sunday after Trinity.
- 15 St. Swithin. † All but Stamp,
Custom, and South-sea House.
- 17 7 Sun. after Trin.
- 20 Margaret, Virgin and Martyr.
- 22 Mary Magdalen.
Q. of Denmark born 1751. †
All but Excheq. & Customs.
- 24 8 Sun. after Trin.
Magdalen College Election:
- 25 St. James *†
- 26 Ann, Mother of the B. V. Mary.
- 27 Portsmouth-Dock fired at 4 in
the Morning, 1770.
- 30 Dog-days begin. Canicula rises
with the Sun.
- 31 9 Sunday after Trinity.
- AUGUST, XXXI DAYS.**
- 1 Lammas day. †
- 4 Crown-Point in America taken
by General Amherst, 1759.
- 6 Transfiguration.
- 7 10 Sunday after Trinity.
Name of Jesus.
- 10 St. Laurence.
- 11 Princess of Brunswick b. 1737. †
All but Cust. and S. S. H.
- 12 Prince of Wales born 1762. †
- 14 11 Sunday after Trinity.
- 15 Assumption.
- 16 Bp. of Osnaburgh b. 1763.
- 17 12 Sunday after Trinity.
Athanasius. Pr. Wm b. 1765.
- 24 St. Bartholomew. †

- 28 13 *Sunday after Trinity.*
St. Augustine.
29 Beheading of St. John Baptist.
30 Sun and Clocks together.

SEPTEMBER, XXX DAYS.

- 1 St. Giles.
2 London burnt, 1666, O. S. †
4 14 *Sunday after Trinity.*
7 Eunuchus.
8 Nativity of the B. V. Mary.
9 Dog-days end. Canis Major rises
with the Sun at 3 in the Morn.
11 15 *Sunday after Trinity.*
14 Holy-Cross Day. † All but Sta.
Custom and South-sea House.
17 Lambert B.
18 16 *Sun. after Trin.*
City of Quebec surrendered to
General Townshend, 1759.
K. George I. and II. landed. †
All but at the Custom-house.
21, 23, 24, Ember-days.
21 St. Matthew. †
22 K. Geo. III. and Q. Charl. Cor.
1761. † Equal Day and Night.
25 17 *Sunday after Trinity.*
26 St. Cyprian.
28 Sheriffs of London sworn.
29 ST. MICHAEL, third Quarter-
day. † Hare-hunting comes
in and lasts till the End of Feb.
Princess Charlotte b. 1766.
30 St. Jerome.

OCTOBER, XXXI DAYS.

- 1 Remigius, Bishop of Rhemes.
2 18 *Sun. after Trin.*
6 St. Faith.
9 19 *S. af. Trin.*
St. Dennis.
10 Old Michaelmas-day. Oxford
and Cambridge Terms begin.
13 Transl. of K. Edw. Confessor.
16 20 *Sun. after Trin.*
17 Etheldred V.
18 St. Luke. †
19 St. Frideswide, a Festiv. at Court.
23 21 *Sunday after Trinity.*
25 K. Geo. III. Access. †
St. Crispin.
26 King George III. proclaimed,
1760. † All but the Stamp,
Excise, Custom and S. S. H.
28 St. Simon and Jude. †

- 30 22 *Sunday after Trinity.*

NOVEMBER, XXX DAYS.

- 1 All Saints. †
2 All Souls. † All but the Stamp,
Custom and South-sea House.
Prince Edward born, 1768.
3 1 Return. All-Souls Col. Elect.
4 K. William b. 1605, O. S.
5 Gun-Powder Treason, 1605. †
6 23 *Sunday after Trinity.*
Mich. Term begins. Leonard.
7 D. Cumberland b. 1745.
8 Princess Augusta Sophia b. 1768.
9 Ld-Mayor's-d. Len. † All but Ex.
11 St. Martin.
12 2 Return.
13 24 *Sunday after Trinity.*
Britius, Bishop.
15 Macrutus.
17 Hugh Bp Lincoln. Anniv. Q. Eliz.
Procl. † All but Cust. & S. S. H.
18 3 Return.
20 25 *Sunday after Trinity.*
Edmund, King and Martyr.
22 Cecilia. Old Martinmas-day.
23 St. Clement.
24 Baliol College Election Thurs-
day before St. Andrew.
25 St. Catharine. 4 Return.
D. of Gloucester born 1743. †
27 *Advent Sunday.*
30 St. Andrew. †

DECEMBER, XXXI DAYS.

- 4 2 *Sunday in Advent.* Barbary.
6 Nicholas.
8 Conception of the B. V. M.
11 3 *Sunday in Advent.*
13 Lucy.
14, 16, 17, Ember-days.
16 O Sapientia. Camb. Term ends.
17 Oxford Term ends.
18 4 *Sunday in Advent.*
21 St. Thomas. †
22 Shortest Day.
23 St. Clement.
Sun and Clocks together.
25 CHRISTMAS-DAY, 4th Quar-
ter-Day. Fox-hunting comes
in and lasts till Lady-day.
26 St. Stephen. †
27 St. John the Evangelist. †
28 Holy Innocents.
31 Silvester, Bishop of Rome.

THE BRITISH PALLADIUM; OR

TABLE of the Moon's Southings, or Times when she passes the Meridian of Greenwich Observatory, for the Year 1774. For the Use of Seamen, in finding the Time of Tides, &c.

Jan.	Feb.	Mar.	Apr.	May	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
2m20	3m18	2m6	3m44	4m39	6m7	6m18	7m13	8m22	8m46	9m51	10m4
3 7	4 8	2 57	4 43	5 35	6 54	7 2	8 0	9 11	9 34	10 41	10 59
3 53	4 59	3 51	5 40	6 30	7 40	7 48	8 47	9 58	10 21	11 32	11 59
4 40	5 52	4 46	6 38	7 21	8 25	8 33	9 34	10 45	11 9	0 27	1 0
5 20	6 47	5 42	7 34	8 10	9 10	9 19	10 22	11 32	12 48	1 24	2 2
6 19	7 44	6 39	8 27	8 57	9 55	10 5	11 10	0 20	0 48	2 23	3 2
7 11	8 43	7 37	9 17	9 43	10 40	10 52	11 57	1 8	1 41	3 22	4 0
8 5	9 42	8 31	10 6	10 28	11 26	11 39	0 44	1 56	2 3	4 22	4 55
9 3	10 40	9 30	10 53	11 13	0 11	0 26	1 33	2 46	3 31	5 20	5 47
10 4	11 16	10 24	11 39	11 59	1 0	1 13	2 17	3 38	4 20	6 15	6 38
11 5	0 20	11 16	0 26	0 45	1 47	1 59	3 3	4 32	5 28	7 8	7 23
0 5	1 20	0 5	1 12	1 32	2 34	2 45	3 51	5 28	6 26	7 58	8 8
1 3	2 9	0 52	1 58	2 19	3 21	3 31	4 4	6 25	7 22	8 46	8 54
1 57	2 56	1 38	2 43	3 6	4 7	4 18	5 33	7 25	8 16	9 33	9 40
2 48	3 42	2 25	3 32	3 53	4 52	5 5	6 28	8 22	9 9	10 19	10 26
3 37	4 27	3 11	4 19	4 40	5 36	5 51	7 25	9 18	9 59	11 6	11 12
4 23	5 12	3 57	5 17	5 27	6 25	6 44	8 25	10 14	10 48	11 3	Morn
5 8	5 58	4 44	5 54	6 14	7 14	7 38	9 25	11 8	11 37	Morn	0 0
5 52	6 45	5 30	6 43	7 1	8 4	8 36	10 25	Morn	Morn	0 40	0 47
6 36	7 32	6 19	7 31	7 48	8 58	9 36	11 25	0 0	0 24	1 28	1 34
7 21	8 20	7 7	8 19	8 38	9 57	10 38	Morn	0 50	1 12	2 15	2 20
8 7	9 9	7 55	9 8	9 29	10 57	11 38	0 19	1 39	2 0	3 3	3 5
8 54	9 58	8 44	9 58	10 23	Morn	Morn	1 12	2 26	2 48	3 50	3 51
9 42	10 47	9 33	10 49	11 21	0 0	0 38	2 2	3 14	3 36	4 36	4 35
10 30	11 36	10 22	11 4	Morn	1 2	1 36	2 51	4 1	4 23	5 21	5 19
11 18	Morn	11 13	Morn	0 21	2 3	2 30	3 39	4 49	5 11	6 6	6 3
Morn	0 25	Morn	0 35	1 23	3 0	3 21	4 26	5 37	5 58	6 52	6 49
0 6	1 15	0 4	1 38	2 25	3 54	4 9	5 13	6 24	6 45	7 37	7 37
0 54		0 56	2 36	3 24	4 44	4 56	6 0	7 12	7 31	8 23	8 29
1 42		1 50	3 39	4 22	5 32	5 42	6 47	7 59	8 17	9 13	9 25
2 30		2 46		5 16		6 28	7 34		9 4		10 25

To find Time of H. Water, on any Day of the Month, at any given Place, for 1774.

Gen. Rule. To the Time of the Moon's Southing (fr. the above Tab.) for that Day, add Time of H. W. at N. and F. Moon in the given Place (fr. Tide-Tab. p. 105, 106, Pal. 65, or any other Tide-T.) and the Sum, abating 12, when above 12^h will be T. of H. W.

Example. To find the Time of High Water, at London, on May 10, 1774.

From the above Table, the Moon souths, at London, on that Day, 11^h 59^m Morn. which add the constant Time of High Water at New and Full, Lond. a 30

Time of High Water, May 10, at London, 2 29 A. req.

Add for next Low Water, 5 30

Low Water at London, May 10, 1774, 7 59 Aft.

I. B. Time of H. W. serves for Boats & Vessels bound to Places below Bridge, fr. Lond.

Time of Low Water serves for Boats & Vessels bound to Places above Bridge, fr. Lond.

** Seamen may determine the Time of H. & L. W. at all Places by the foregoing Gen. R. fr. the above Tab. and the constant Time of H. W. at N. & F. Moon, at each Place, Tide-Table. The above Table is also of Use for finding the Moon's near Time of Rising, Setting, from her mean Place, and Semi-duration Arc, for any Place.

TABLE

TABLE of the Eclipses of the first SATELLITE of JUPITER, for Gr. Obl. 1774
For finding the Difference of Longitude, by Sea or Land.

January.				February.				March.				April.				May.				June.								
Emerfions				Emerfions				U this Mth				U's Sat. are				Immerf.				Immerf.								
D.	h	m	s	D.	h	m	s	being fo near	○, the Eclips	o. his Sat. cas	not be seen.	The *is plac	i ho' it may be	seen that U's	affages ever	the Merid. is a	direct Copy of	the Paris Tmes.	the Times of	bes. Eclipses in	N. Ep. is an ex	ast. p. of the	in Con des Tms.	reduc'd to Me.	of Greenwich,	East; if	fooner, West	of Greenw.
2	9	33	39	1	11	36	57	○, the Eclips	y being too	near the Sun.																		
4	4	1	49	3	6	5	44	o. his Sat. cas																				
5	22	30	1	7	0	34	33	not be seen.																				
7	16	58	13	6	19	3	26	The *is plac																				
9	11	26	28	8	13	32	19	against the																				
11	5	54	46	10	8	1	16	visible Eclips																				
13	0	23	3	12	2	30	13	ies of the first																				
14	18	51	26	13	20	59	14	Sat. of U fo																				
16	13	19	50	15	15	28	15	Greenwich.																				
18	7	48	15	17	9	57	22	N.B. When																				
20	2	16	4	19	4	26	27	the Time a																				
21	20	45	10	21	12	55	36	the Ship is la																				
23	15	13	40	22	17	24	45	ter than that																				
25	9	42	15	24	11	53	58	at Greenwich,																				
27	4	10	51	26	6	25	10	the Longitude																				
28	11	39	32	28	0	52	23	East; if																				
30	17	8	12					fooner, West																				
								of Greenw.																				

July.			August.			Septemb.			October.			Novemb.			Decemb.		
Immerf.			Immerf.			Immerf.			Immerf.			Immerf.			Emerfions		
D.	h	m s	D.	h	m s	D.	h	m s	D.	h	m s	D.	h	m s	D.	h	m s
1	20	22 45	2	16	52 55	1	19	2 28	1	21	16 12	2	17	55 23	1	3	36 13
3	14	50 54	4	11	21 28	3	13	31 26	3	15	45 13		Emerfions		2	22	4 16
5	9	19 8	6	5	50 5	5	8	0 27	5	10	14 12	4	14	31 42	4	16	32 15
7	3	47 20	8	0	18 45	7	3	29 28	7	4	43 13	6	9	0 13	6	11	0 17
8	22	15 33	9	18	47 23	8	20	58 33	8	23	12 11	8	3	28 43	8	5	28 19
10	16	43 48	11	13	16 6	10	15	27 34	10	17	41 9	9	21	57 19	9	23	56 16
12	12	11 57	13	7	44 51	12	9	56 38	12	12	10 4	11	16	25 41	11	18	24 17
14	5	40 14	15	2	13 34	14	4	25 38	14	6	39 0	13	10	54 4	13	12	52 13
16	0	8 33	16	20	42 23	15	12	54 45	16	1	7 54	15	5	22 25	15	7	20 12
17	18	36 51	18	15	11 12	17	17	23 47	17	19	36 47	16	23	50 44	17	1	48 7
19	13	5 11	20	9	40 0	19	11	52 51	19	14	5 38	18	18	19 2	18	20	16 7
21	7	33 37	22	4	8 53	21	6	21 55	21	8	34 28	20	12	47 18	20	14	44 4
23	2	1 55	23	22	37 48	23	0	50 57	23	3	3 17	22	7	15 29	22	9	12 1
24	20	30 23	25	17	6 40	24	19	19 59	24	21	32 4	24	1	43 41	24	3	39 57
26	14	58 59	27	11	35 3	26	13	49 4	26	16	0 48	25	20	11 51	25	22	7 51
28	9	27 21	29	6	4 34	28	8	18 7	28	10	19 30	27	14	40 0	27	16	35 53
30	3	55 46	31	0	33 33	30	2	47 8	30	4	58 11	29	9	8 6	29	11	3 52
31	22	24 29							31	23	26 49				31	5	31 52

To find the Difference of Longitude from Greenwich Observatory.

Rule. The Difference of Time between any Eclipse of Jupiter's first Satellite, at Greenwich, happening as above, and the Time the same Eclipse is observed to happen under a distant Meridian, being turned into Degrees, at Sea or Land, will be the Difference of Longitude between Greenwich and the Place of Observation.

Example. Eclipse of 1st Satellite of Jupiter at Greenwich, June 12^d 9^h 12^m 50^s. The same Eclipse being observed at Sea, or a distant Port, later, 12 15 0 18

Hence, Dif. Lon. to the East of Greenw is 86° 52' 35", req. Dif. later, 5 47 28

Two ECLIPSES of the SUN, for 1774.

I. *March 12^d 9^h 56^m, Morning, invisible in England. The Moon's Latitude 1' North.*

This Eclipse is central and annular, at Noon, in Latitude 2° South, and Longitude from Greenwich 31° East.

*Mr. Maskelyne, Astronomer-Royal, makes the Time, in his Astronomical Ephemeris, 9^h 55^m $\frac{1}{2}$, Morning; Moon's Latitude 1 $\frac{1}{2}$ ' South; centrally eclipsed on the Meridian at 9^h 57^m, in Latitude 10 $\frac{1}{4}$ ' South, and Longitude 30 $\frac{1}{2}$ ' East, from Greenwich; according to *De la Lande*, in the *Connoissance des Temps, pour l'Année 1774*; allowing the Difference of the Longitude from *Ferro* 49° at *Paris* — 18° 15' for that from *Greenwich*; the Longitude from *Ferro* being set down at *Paris* so much more.*

II. *September 6^d 1^h 59^m, Morning, invisible in England, Moon's Latitude 2° 30' North. This Eclipse is central and total in 10° North Latitude and 151° East Longitude from Greenwich.*

*Mr. Maskelyne makes the Time 1^h 59^m Morning; Moon's Latitude 2' North; eclipsed on the Meridian at 1^h 58^m in Latitude 9° North, and East Longitude 150 $\frac{1}{2}$ ', from Greenwich; according to *De la Lande*, in the *Connoissance des Temps, pour l'Année 1774*; allowing for the Difference of the Longitude from *Ferro* about 169° at *Paris* — 18° 15' for that from *Greenwich*.*

☞ The *Connoissance des Temps* (on all Occasions) is seen to be a very helpful Book to Mr. Maskelyne, and his Sub-Computers for executing the Office of Astronomer Royal.

The Obliquity of the Ecliptic with the Equinoctial, in the Nautical Ephemeris.

January	1 . .	23° 27' 58".1
April	1 . .	same
July	1 . .	same
October	1 . .	23 27 58 .3
December	31 . .	23 27 58 .5

These pretending Calculations to Exactness are according to Theory and not Practice, and therefore not to be depended on.

If a practical Astronomer supposed this Obliquity to be 23° 28', (which is all that can be meant by the foregoing Niceties,) how would the Hair-Dividers upbraid him for notorious Error!

N. B. The above Obliquities are of the same Use, as much to the Purpose, and as infallible, as the Maxima of the several (borrowed and patched-up) astronomical Equations, inserted in the Nautical Ephemeris.

Former practical Astronomers contented themselves with 23° 30' Obliquity, till the French Astronomers, supposing their Instruments improved, and prefiging, as their Nation does, over Fashions, first introduced the Mode of 23° 29', then 23° 28' $\frac{1}{2}$, Obliquity. Afterwards, Mr. Mayer, setting up to rival these French Refiners, farther refined the Obliquities to the foregoing pretending Accuracies.

ADVERTISEMENT,

☞ Our Correspondents, in general, are desired to send all their Letters and Productions before the End of May (franked or Post-paid); the sooner they send the more they can be obliged; directed to the Palladium Author, at Mr. Cole's, Mathematical Instrument Maker, Fleet-Street, London. — No Letters will be received but what are Post-paid,

NUMBER III.

ALPHABETICAL CHRONICLE of REMARKABLE EVENTS.

According to Authorities.

N. B. b stands for *before*, and *s* since, *Christ*; or a Date without any *Mark* before it denotes *since Christ*.

A. B. s. since Christ.

Addison, Rev. Launcelot, died 1703

Ado, Historian, died 874

Adela came over from Germany, and established the Kingdom of South Saxony. 477, and was thus first King of Sussex, died 519

African Company established 1695

Agricola, Rod. aged 43, died 1485

Anacarsibus flourished b 340

Andronicus, the peripatetic Philosopher, flourished b 100

Anne Bulleyn, 2d Wife to Henry VIII. crowned June 1, 1533, beheaded May 14 (aged 29) 1536

Anne, Queen to James I. died March 3, aged 44, 1619

Arbutnot, Dr. born 1681, died 1739

Ariosto, the Italian Poet, born 1474, died 1554

Arthur, eldest Son of K. Henry VII. died Apr. 2, 1502

Abelstan made King of Kent by Ethelwolf 848

Athenagoras, the Athenian Philosopher, flourished 150

B.

Bath burnt 1117

Becket, Thomas, made Chancellor to Henry II. 1157

impeached, 1164; retired to France that Year; agreed with Henry, July 22, 1170;

murdered in the Cathedral of Canterbury, Dec. 29, 1171; canonized by Alexander III. Aug. Wednesday 1172

Berwick upon Tweed burnt, 1173; again by John 1216

Billinggate, great Fire at, January 13 1715

Bacian War commenced, b 379, ended b 366

Bastius, Historian, died, about 2950

Boileau, French Poet, born 1630, died 1712

Boyle, Robert, died 1691

Boyle, Roger, 1st Earl of Orrery, born 1621, died 1679

Braddock, General, killed at Du-Quene in America, July 9 1755

Briggs, Dr. William, died 1704

Briggs, Henry, (Calculator of Logarithms,) born 1556, died 1691

Buckingham, Duke of, beheaded at Salisbury, November 20 1483

Buckingham, George Villiers, Duke of, born 1627, died 1688

Buckingham, John Sheffield, Duke of, born 1649, died Febr. 24 1721

Burgundy, Duke of, assassinated by Order of the Dauphin 1419

Cade, Jack, killed by Alexander Iden, Sheriff of Kent 1451

Calvin, the Reformer, died at Geneva, aged

45, May 27 1554

Caracallus defeated by Otterius Scapula, a Roman General 2150

Chichester burnt by Ciss, 1113; again 1186

Churchill, Rev. Charles, the Poet, born 1731, died 1764

Cootney Act passed 1669

Dacier, Madame; a French Writer, born 1651, died 1720

Daniel (the Scripture Prophet) sent Captive to Babylon, b 6064

Interpreted Nebuchadnezzar's Dream, 603;

cast into the Den of Lions, 553; from a Vision predicted the

Perish of Empire under Alexander the Great b 334

Dartmouth burnt by the French 1377

Defos, Daniel, died 1731

Derwentwater, Earl of, and Lord Nessair, beheaded on Tower-hill, Feb. 24 1716

Digby, Sir Kenelm, born 1603, died 1665

Derceffer, in Oxfordshire, burnt, Aug. 7 1613

Dorset, Thomas Sackville, Earl of, born 1556, died 1608

Dorset, Charles Sackville, Earl of, born 1637, died 1706

Dugdale, Sir Wm, (Antiquarian,) born 1605, died Febr. 1685

Duncan, K. of Scots, murdered by Macbeth 1054

E,

-E.

East-India Company established 1689
 — *old Company re-established* 1700

Edward II. born at Carnarvon, in Wales, April 25, 1284; he was the first Prince of Wales; ascended the Throne, July 7, 1307; married Isabella, Daughter of France, 1308; obliged by the Barons to sign a Commission, by which he vested the Government of the Kingdom in 12 Persons, March 16, 1308; went to Boulogne on a Pilgrimage, Dec. 13, 1313; dethroned, Jan. 13, 1327; was succeeded by his eldest Son, *Edward III.* murdered at Berkley-Castle, Sept. 21, following, and buried in St. Peter's Gloucester.

Edward III. born, at Windsor, Nov. 15, 1312; succeeded to the Crown, Jan. 13, 1327; crowned, at Westminster, Febr. 1, following; married Philippa, Daughter of the Earl of Hainault, Jan. 24, 1328; was offered the Empire of Germany, Aug. 1348; fought in single Combat with a Frenchman at Calais, and conquered, Jan. 7, 1349; died of a Cingle, at Richmond, June 21, 1377, and was succeeded by his Grandson, *Richard II.* Son to *Edward the black Prince*.

Edward the Black Prince born June 15, 1330; brought the King of France Prisoner to Eng-

land, from the Battle of Poitiers, May 24, 1357; made an Expedition in Castile, 1367; died, June 8, 1376.

Edward IV. born, 1443; elected King, March 5, 1461; crowned June 29, 1461; married Lady Eliz. Gray, Widow of Sir John Gray, at Grafton, in Buckinghamshire, 1464; taken Prisoner by the Earl of Warwick, Mar. 1470; but escaped soon afterwards; expelled the Kingdom, 1470; returned, March 25, 1471, and restored; died, April 9, 1483, at Westminster, and was succeeded by his Son, *Edward V.*

Edward V. born 1470; succeeded to the Crown, Apr. 9, 1483; conveyed to the Tower, May, 1483; deposed June 20, following, and, with the Duke of York, his Brother, smothered in the Tower soon after, leaving his Uncle, *Richard III.* Successor to the Throne.

Edward VI. born Oct. 12, 1537; succeeded to the Throne, Jan. 28, 1547; crowned, Sunday, Feb. 20, following; died of a Consumption at Greenwich, July 6, 1553; and was succeeded by his Sister *Mary*.

Edwy began his Reign in 955, aged 17; died in 959, and was succeeded by his Brother *Edgar*.

Egbert, the Father of the English Monarchy, be-

gan his Reign, as King of Westsex, 800; conquered Mercia, 828; became Sovereign of all England South of the Humber, 829; drove the Danes out of Britain, 836; died, 838; and was succeeded by his Son *Ethelwolf*.

Elizabeth, Queen to *Henry VII.* died in Child-bed, Feb. 11 1503

Elzevir, Dutch Printers; *Lewis* began to be famous, 1595; *Daniel* died 1681

Emma died (*see Ethelred, Canute*) 1052

Exeter taken by *Sweyn*, King of Denmark, and destroyed, 1003; rebelled, 1067, and was taken by *William the Conqueror*.

F.

Falkland, *Lucius*, Lord, born 1610; killed at the Battle of Newbury, Sept. 1643

Ferrar, Bishop of *St. David's*, burnt at *Carlmarthen*, March 30 1555

G.

Galileo, born in Italy, 1564, died 1642

Gaustan, Favourite of *Edward II.* murdered, July 1 1312

Glocester burnt in 1102, again in 1122

Glocester, Duke of, Uncle to *Richard II.* smothered between two Feather beds, Feb. 18 1397

Glocester, Duke of, Brother to *Edward IV.* murdered *Edward*, Pr. of Wales, 1471; crowned the Duke of *Clarence* in a Butt of *Malmsey*, 1478; made *Protector*

- Protector of England, 1483; elected King, June 20, following. See Richard III.
- Glocester*, Duke of, Son to Queen Anne, died of a Fever, aged 12, July 29 1700
- Gregory*, James, the great Astronomer and Mathematician, died, aged 40 1675
- Gresham College* founded by Thomas Gresham, 1581, who died 1579
- Grey*, Lady Jane, proclaimed Queen, July 9, 1553; beheaded in the Tower, aged 17, Feb. 12 1554
- Grotius*, Hugo, born at Delft, 1586, died 1645 H.
- Hall*, one of the Murderers of the Duke of Gloucester, hanged at Tyburn 1399
- Haman* hanged by Order of Ahasuerus b 509
- Hanna* flourished b 403
- Hanoverian Succession* settled, June 12 1700
- Harfleur* taken by the English, Sept. 18 1415
- Harley*, Robert, Earl of Oxford, born, 1661, died 1724
- Hastings* burnt by the French 1377
- Hengist and Horsa*, two Saxon Brothers, landed at the Isle of Thanet 449
- Henry II.* Grandson of Henry I. began his Reign, 1154; arrived in England, Dec. 8, and was crowned the 10th, with his Queen Eleanor, at London; crowned again at Lincoln, 1158; again at Westminster, 1159; quelled the Rebellion at Maine, 1166; had his Son Henry crowned King of England, 1170; invaded Ireland and conquered it, 1172; did Penance at Becket's Tomb, July 2, 1174; took the King of Scotland Prisoner, and obliged him to give up the Independency of his Crown, 1175; named his Son John King of Ireland, 1177; had, the same Year a criminal Amour with Alice of France, lost his Son Henry, June 11, 1183; made a Convention with Philip of France to go to the holy War, 1188; died with Grief at the Altar, cursing his Sons, July 6, 1189, aged 57. He was succeeded by his eldest Son, Edward I.
- Henry III.* born Oct. 1, 1207; crowned at Gloster, Oct 28, 1216; done Homage to by Alexander King of Scotland, at Northampton, 1218; crowned again at Westminster, after Christmas, 1219; married Eleanor, Daughter of the Count of Provence, Jan. 14, 1236; gave his Daughter Margaret in Marriage to the King of Scots, 1252; shut himself up in the Tower for Fear of his Nobles, 1261; taken Prisoner at Lewes, May 14, 1264; wounded in the Shoulder, at the Battle of Evesham; died with Age at St. Edmund's-bury, Nov. 16, 1272, and was succeeded by his eldest Son, Edward I.
- Henry IV.* born 1367, crowned October 12, 1399; conspired against, Jan. 5, 1400; died in Jerusalem-Chamber, Westminster, May 20, 1413; was buried at Canterbury, and succeeded by his Son, Henry V.
- Henry V.* born 1388, crowned Apr. 9, 1413; married the Princess Catharine of France, May 30, 1420; entrusted with the Government of France, and declared Heir to the Crown, May 21, 1420; died of a Fistula at Roan, aged 33, Aug. 31, 1422; was buried at Westminster, and succeeded by his Son, Henry VI.
- Henry VI.* born at Windsor, Dec. 6, 1421; succeeded to the Throne, August 31, 1422; proclaimed King of France, ditto; crowned at Westminster, Nov. 6, 1429; crowned at Paris, Dec. 17, 1430; married to Margaret, Daughter of France, Apr. 22, 1445; taken Prisoner at the Battle of St. Alban's by the Duke of York, 1455; deposed by his 4th Cousin, Edward IV. March 5, 1461, and fled to Scotland; taken Prisoner in Lancashire, 1463; restored to his Throne, 1470; taken Prisoner again by Edward, Apr. 11, 1471; died in the Tower, aged 49, in May following.
- Henry VII.* succeeded to the Throne, August 22, 1485; crowned, Oct.

Oct. 30, following;
 married Elizabeth,
 Daughter of Edward
 IV. Jan. 28, 1486;
 crowned his Queen,
 Nov. 25, 1487; mar-
 ried his eldest Daugh-
 ter, Margaret, to James
 IV. of Scotland; died
 of a Consumption, at
 Richmond, April 22,
 1509, aged 51; and
 was succeeded by his
 2d Son, Henry VII.
Henry VII's Chapel, its
 first Stone laid, Jan.
 1502
Henry VII. born, June
 28, 1491; began to
 reign, April 22, 1509;
 married his Brother's
 Wife, Catharine, In-
 fanta of Spain, June
 3, 1509; crowned,
 June 24, following;
 received the Title of
 Defender of the Faith,
 1521; styled Head of
 the Church, 1531; di-
 vorced Queen Catha-
 rine, and married Ann
 Bullen, May 23, 1533;
 excommunicated by
 Pope Paul, Aug. 30,
 1535; put Q. Anne
 to Death; and married
 Jane Seymour, May
 20, 1536; married
 Anne of Clever, Jan.
 6, 1539; divorced her,
 July 10, 1540; mar-
 ried Catharine How-
 ard, Aug. 8, follow-
 ing; put her to Death,
 Feb. 12, 1542; married
 Cath. Parr, Jul. 12, 1542;
 died Jan. 18, 1547; was
 buried at Windsor, and
 succeeded by his Son,
 Edward VI.
Henry III. King of France,
 murdered by a Monk,
 August 1, 1589
Henry, Prince of Wales,
 eldest Son of James I.

died of a Purgings,
 aged 18, Nov. 6 1612
*Herculanum and Pompei-
 um*, Cities of, reduced
 to Ashes 79
Herod began to reign in
 Judæa, b 55; put his
 Wife Mariamne to
 Death, and his Mo-
 ther-in-Law Alexan-
 drina, b 28; began to
 rebuild the Temple of
 Jerusalem, b 18; put
 his two Sons to Death,
 by Order of the Jewish
 Council, b 6; died,
 Nov. 25, b 4
Hertford, in England, re-
 built 913
Hillary, St. died, aged
 80 367
Hobbes, Thomas, (a fa-
 mous Scholar,) died,
 aged 90 1679
Holfernes killed by Ju-
 dith b 688
Holt, Lord Chief Justice,
 died, aged 67, March
 6, 1710
Horsa (see *Hengist*) slain
 by Vortimer 455
Horse-Guards, instituted
 1550
Hospital, St. Bartholo-
 mew's, founded by
 Henry VIII. 1539;
 Christ's, by Edward VI.
 1552; Bridewell and
 Bethlehem, by Dittop;
 1553; St. Thomas's,
 by Ditto, 1553; Lon-
 don-Workhouse, 1611;
 for French Protestants,
 incorporated, 1718;
 Guy's, by Thomas
 Guy, Esq. 1722;
 Westminster Infirma-
 ry instituted, 1720;
 incorporated, 1739;
 London, instituted,
 1740; Ditto incorpo-
 rated, 1758; Middle-
 sex, instituted, 1745;
 Small-Pox, Sept. 26,
 1746; Lock, 1746;

Corporation for sick,
 &c. Seamen, incorpo-
 rated, June 24, 1747;
 British Lying-in, in-
 stituted, Nov. 1749;
 London Lying-in, Mar.
 30, 1750; St. Luke's,
 1751; Magdalen and
 Asylum, instituted,
 1758.
Hotbaw, Sir John, and
 his Son, beheaded, Jan.
 1645
 I.
Idolatry first abolished
 from Kent by Ercom-
 bert, who began his
 Reign 640
Ilum burnt, b 1359, 64
 Years before the Ar-
 gonautic Expedition.
Innocent XI. Pope, died,
 August 2, 1689
Jacob returned into the
 Land of Canaan,
 b 1739; went with
 his Family into Egypt,
 b 1706, died, aged 147,
 b 1689
James I. King of Scot-
 land, murdered 1487
James I. born, at Edin-
 burgh, June 19, 1566;
 crowned King of Scot-
 land, August, 1567;
 married the Princess
 of Denmark, 1589;
 succeeded to the Crown
 of England, March 24,
 1603; arrived at Lon-
 don, May 7, follow-
 ing; went into Scot-
 land, March 4, 1617;
 returned the Septem-
 ber following; lost his
 Queen, Mar. 3, 1619;
 died of an Ague, Mar.
 27, 1625; and was
 succeeded by his second
 Son, Charles I.
James II. born Oct. 30,
 1633; married Mrs.
 Anne Hyde, Sept. 3,
 1660; married the
 Princess of Modena,
 Nov.

- Nov. 11, 1673; succeeded to the Throne, Feb. 6, 1685; fled from his Palace, Dec. 12, 1688; was seized soon after at *Feverham*, and brought back to *Whitehall*; left *England*, Dec. 23, following; landed with an Army at *Kinsale*, in *Ireland*, Mar. 22, 1689; returned to *France*, Jan. 1690; died at *St. Germain's*, Sept. 6 1701
- Jane Seymour*, Wife to *Henry VIII.* died in Childbed, Oct. 1538
- Jephtha* took his rash Vow, b 1187; died b 1182
- Jeremiah* began to prophesy, b 629; wrote his *Lamentations*, b 610; imprisoned, b 609; foretold the Jewish Captivity, b 607; died about b 577
- Jesuits Society* established by *Ignatius* 11536
- Jesuf*, Son of *Sirach*, lived b 247
- Jews* massacred, Sept. 3, 1189; Numbers executed for clipping, 1278; totally expelled *England* 1290
- John*, St. the Evangelist, put into a Cauldron of boiling Oil, but taken out unburnt, 93; wrote his *Revelations*, 96; his Gospel, 97; died, aged 91, Dec. 27 99
- John*, the Baptist, preached Repentance in the Wilderness, 28; imprisoned, 30; died 32
- Jones*, *Inigo*, born about 1572; died 1632 K.
- Kilmarnock*, Lord, and Lord *Balmorino*, beheaded on Tower-hill, August 1746
- L.
- Lincoln* Town burnt by the King's Command 1173
- Lothar*, Earl of, Regent of *Scotland*, murdered 1571
- Loth*, the Fast of, first established in *Kent* by *Escombert*, about 640
- Louis* Philip of *France's* Son, laid Claim to the Crown of *England*, and landed with an Army in the Isle of *Thames*, May 23 1216
- Leyden University* founded 1575
- Loughborough*, *William Fitz Osbert*, a Lawyer so called, a notorious Ruffian, hanged at *Tyburn* in 1197
- Lowes*, Lord, beheaded on Tower-hill 1746 M.
- Mahabury*, *William* of, wrote in 1140
- Mahs*, Knights of, established 1113
- Mary*, Queen, born 1516; proclaimed, July 19, 1553; crowned Sep. 30 following; married Philip of *Spain*, Jan. 19, 1554; died of a Dropsy, Nov. 17, 1558; was succeeded by her Sister *Elizabeth*.
- Mary*, Queen of *Scots*, fled to *England*, May 16, 1568; imprisoned in *Tilbury-Castle*, Jan. 1569; removed to *Fotheringay*, 1586; there beheaded, aged 44 F. 8.
- Mary*, *William's* Queen, born April 30, 1662; proclaimed, with her Husband, Queen of *England*, Feb. 13, 1689. (See *William III.*) Died of the Small-Pox.
- Matilda*, *Stephen's* Queen, crowned Easter-day, 1135; died, May 3, 1151, at *Hennigham-Castle*, *Essex*, and buried in a Monastery at *Fevertham*.
- Mauds*, Daughter of *Henry I.* married to *Henry IV.* Emperor of *Germany*, 1109; her Right to succeed her Father sworn to by the *English*, 1127; married to the Earl of *Anjou* the same Year; set aside from the Succession, 1136; landed in *England*, and claimed her Right to the Crown, Sept. 1139; crowned, but soon after defeated at *Winchester*, 1141; escaped to *Glocester* in a Boat; fled from a Window of *Oxford-Castle*, by a Rope, in the Winter, 1142; retired to *France*, in Lent, 1147; came to *England*, and made a lasting Peace with *Stephen*, in 1153; died abroad, Sept. 10 1167
- Maximilian*, the Emperor, enlisted as a Subject and Captain under *Henry VIII.* when he invaded *France* in 1513
- Menander*, the Athenian, born 343
- Merlin*, the Prophet, lived in 477
- Milo* banished for killing *Clodius* b 52
- Mississippi Scheme* 1720
- Mortimer*, *Roger*, Earl of *March*, hanged at *Tyburn*, Nov. 29 1330
- Mortmain Act* passed, Nov. 29 1279
- Murray*, Earl of, Regent of *Scotland*, assassinated, Jan. 23 1570 N.
- Newcastle on Tyne* founded by *Robert*, Son to *William*

William the Conqueror, in 1081; burnt to the Ground by Accident 1349

Normandy (see *Rolls*) invaded on all Hands in 1117

Normans massacred at Durham 1069

Northampton burnt by Accident, Sep. 3 1675

Nottingham burnt to Ashes 1148

O.

Orange, Prince of, born Nov. 4. 1650; created Stadtholder, July 3, 1672; married the Princess Mary of England, Nov. 4. 1677; landed at Torbay, in England, with an Army, Nov. 5. 1688; declared King of England, Feb. 13. 1689. (See *William III.*)

Orpheus, the Poet of Crotona, flourished b 576

Osway, Thomas, (Poet,) born 1658

P.

Partridge, John, (Astrologer and Almanac-Maker,) died 1715

Pasover instituted, Monday, May 4. b 1491

Paul, St. converted, 33; caught up into the 3d Heaven, 44; visited

Athens and Corinth, 50; wrote his 1st Epistle to the Corinthians, and that to the Gallatians, 51; returned to Ephesus, 52; wrote his 1st Epistle to the Thessalonians, 52; his second, 53; put into Bonds and brought to Rome, 55; wrote his 2d Epistle to the Corinthians, and that to the Romans, 58; those to the Philippians, Ephesians, Co-

lossians, and Philemon, 62; that to the Hebrews, 63; his 1st to Timothy and that to Titus, 65; his 2d to Timothy, 66; died, June 29 67

Persecution by the Jews, the 1st in 33; second, 44; first general, of the Christians, under Nero, 64; 2d ditto, under Domitian, 93; 3d ditto, under Trajan, 107; 4th ditto, under Marcus Aurelius, 164; 5th ditto, under Severus, 202; 6th ditto, under Maximianus, 235; 7th ditto, under Decius, 250; 8th ditto, under Valerian, 257; 9th ditto, under Aurelian, 272; 10th ditto, under Dioclesian, 302; 11th ditto, by the Arians, under Constantine, 337; 12th ditto, under Julian the Apostate 361

Persius born, Dec. 4. 42; died, aged 28.

Peterborough burnt 1117

Philip of Macedon murdered by Pausanias b 336

Philippa, Queen of England, died at Windsor, Aug. 15, 1369; and was buried at Westminster.

Plantagenet, Geoffry, Earl of Anjou, married the Empress Maud, 1127; invaded Normandy 1137

Pole, Cardinal, died, aged 58. Nov. 18 1558

Porteus, Captain, put to Death by the Mob at Edinburgh, Sept. 7, 1736

Pyrrhus began to reign at Epirus, 295; wound-

ed in the Battle with the Romans, in which he lost 20000 Men, they 5000; killed, as he was fighting, by a Woman's throwing a Tile at his Head b 278

Q.

Quercus, Don, a famous visionary Spanish Author, died 1647

R.

Raphael (a famous Painter) born at Urbino, 1483; died 1520

Rebellion of the English against William Rufus, in Favour of his Brother Robert, 1088; extinguished 1090

— of the Welch, who defeated the Normans and English 1095

— of the English, under Wat Tyler, June 12 1381

— of the Barons 1387

— of the English and Welch 1400

— of Jack Cade, in Favour of the Duke of York 1450

— of the English 1469

— Ditto 1536

— Ditto 1549

— of Wyatt 1554

— in the North 1569

— of the Irish, under Tyrone 1599

— of the Scotch 1639

— of the Irish 1641

— of the Scotch 1666

— under Monmouth, June 11 1685

— of the Scotch, under the Pretender 1715

— Ditto 1745

Richard I. born at Oxford, 1157; crowned at London, Sept. 3, 1189; set out on the Crusade, and joined Philip of France on the Plains of Vezelay, June 29, 1190; took Messina

Mellina the latter End of the Year; married Berengaria, Daughter of the King of Navarre, she being with them, May 12, 1191; defeated the Cyprians, 1191; taken Prisoner near Vienna, on his Return Home, by the Duke of Austria, Dec. 20, 1192; ransomed, and set at Liberty, Feb. 4, 1194. When he gained a Victory over the French at Gisors, about this Time, *Not we, (says he), but Dieu et mon Droit, (i. e.) God and my Right, have obtained this Victory*; ever since which the Kings of England have made it their Motto. He returned to Engl. Mar. 20, following; wounded in the Shoulder, abroad, with an Arrow, at the Castle of Chalus, near Limoges, which mortifying, he died, April 6, 1193, and was succeeded by his Brother John.

Richard II. born at Bourdeaux, Jan. 6, 1367; made Guardian of the Kingdom, August 30, 1372; created Prince of Wales, 1376; succeeded his Grandfather, Edward III. June 21, 1377; crowned at Westminster, July 16, following; married to Anne, Sister to the Emperor of Germany, Jan. 14, 1382; buried his Queen, August 3, 1394; married Isabella, Daughter of France, Autumn, 1396; taken Prisoner by Henry, Duke of Lancaster, and sent to the Tower, Sep.

1, 1399; resigned his Crown, Sept. 28, following, and was succeeded by his first Cousin, Henry IV. Duke of Lancaster, Grandson to Edward III. murdered in January, 1400, at Pomfret-Castle; buried at Langley, but afterwards removed to Westminster.

Richard III. eldest King, June 20, 1483, crowned, July 6, following; ditto at York, Sep. 1; slain at the Battle of Bosworth, August 22, 1485, aged 32; and was succeeded by his Cousin, Henry VII. He was buried at Leicester.

Richmond, Countess of, Henry VIII.'s Grandmother, died 1309
Rupert, Prince, died, aged 62, Nov. 29 1682
Rye burnt by the French 1377

S.

Sannite War ended, after 71 Years Continuance b 272

Sandwich burnt 1217

Sarah, Abraham's Wife, died, aged 127 b 1859

Sardis, City of, taken and burnt by the Athenians b 504

Scævola, Mutius, burnt his right Hand, before Porcenna, for having accidentally killed his Secretary, when he designed to have slain him b 508

Schomberg, Duke of, landed in Ireland, near Carrickfergus, with an Army, Aug. 13, 1689; killed at the Battle of the Boyne 1690

Shaftesbury built by Alfred 879

Simpson, Thomas, the Mathematician, died 1762

Society, Royal, instituted, Dec. 30, 1660; incorporated, 1663; for Reformation of Manners, form'd 1698; for Promotion of Christian Knowledge, established 1699; for the Propagation of the Gospel, (incorporated) 1701; Antiquarian, Nov. 12, 1751; Unit. Socy, established, 1759; Marine, established 1796

Somerfet-house built by the Duke of Somerfet, Protector 1549

South, Rev. Dr. Robert, born, 1633; died 1710
Spencers, Father, Son, and Grandson; the Father hanged at Bristol, aged 90, in Oct. 1326; the Son hanged at Hereford, Nov. 24, following; the Grandson beheaded at Bristol 1400

Spinoza, Benedict, (an atheistical Author,) died at the Hague, aged 44 1677

Stafford, Lord, beheaded through the Perjury of false Witnesses, Dec. 29 1680

Statius born, about 42; died about 102

Stephen, the first Martyr, stoned, Dec. 26 33

Stephen, King, crowned, Dec. 2, 1135; defeated and taken Prisoner at Lincoln by the Earl of Gloucester, Maude's Brother, Feb. 1141; and put in Irons at Bristol-Prison, but released, on an Exchange for the Earl of Gloucester, who was taken Prisoner

Prisoners at Winchester; made Peace with Henry, Maude's Son, in 1153; died of the Piles, Oct. 25, 1154, aged 50; was buried at Faversham, and succeeded by his Cousin, Henry II. Duke of Normandy, Son of Maude by the Earl of Arjou.

Seckham, City of, began to be built: 1095

Stratford, Earl of, beheaded on Tower-hill, aged 28, May 18, 1541

Stratford upon Avon burnt, Aug. 1, 1614

Swathius Pankaus, in the Reign of Nero, invaded the Isle of Anglesey, and burnt the Druids, 59; defeated Boadicea at London, and slew 80000 of the Britons, the same Year.

Sulpitius, the Historian, died 480

Sweyn, King of Denmark, drove Etheldred II. from his Kingdom, 1013; but was killed, February 2, 1013, at Gainborough, and was buried at York.

Sweinbin, Bishop of Winchester, died 854

T.

Temple, Sir Wm, died, aged 69, Jan. 1699

Tebes, the City of, rebuilt by Cassander, 6315, 80 Years after it had been destroyed.

Themistocles, the Athenian General, died, aged 65, b 449

Theodosius the Great made his Entry into Constantinople, 380; died, aged 60, 395

Theophrastus born at Lillibon, b 322; died b 288

Tibetford (in Norfolk) burnt

by the Danes in 1020
Tibule, the Order of the, founded, 812; revived 1705

Thorp, Speaker of the H. of Commons, murdered by the Mob 1480

Titian, Venetian Painter, born, 1477; died 1576

Tarquatus, Manlius, caused his own Son to be put to Death, for fighting contrary to his Orders, though he gained an Advantage over the Enemy b 340

Tribunes of the People, instituted at Rome, 495; military, with consular Power, created b 445

Trump, Van, the Dutch Admiral, killed in an Engagement, July 29, 1653

Tyrrrell, Admiral, died of an Apoplexy, at Sea, in his Passage from Antigua to England, on-board the Princess Louisa Man of War, June 26, 1766
See Pal. 1767, p. 69.

V.

Vanini, at Thoulouse, died a Martyr to Atheism, aged 33, who was burnt Feb. 19, 1619

Venables's Expedition to America, Dec. 4, 1654

Virgil, Polydore, died, aged 80, 1555

Vortigern made King of Britain, 447; deposed, 455; reassumed the Crown, 457; deposed again 465

Vortimer, Son of Vortigern, succeeded to the Government of Britain, 455; died 457

W.

Wales conquered, and divided among the Conquerors, 1095; again completely conquered

and annexed to the Crown of Eng. 1283

Waller, Edmund, the Poet, died, aged 82, 1687

War with Scotland, 1608; Peace with Ditto 1691

→ with France, 1213; again, 1216; Peace with Ditto 1118

→ with Scotland 1139

→ with France, 1161; Peace with Ditto 1126

→ again, with Success, in France, 1194; Peace with Ditto 1195

→ with France 1201

→ civil, renewed 1215

→ ended 1216

→ with France 1225

→ ended 1243

→ civil 1262

→ ended 1267

→ with France 1294

→ with Scotland, 1296; Peace with France, 1299; Ditto with Scotland, Mar. 30, 1323

→ again with Scotland 1327

→ ended 1328

→ again with Scotland 1333

→ with France, 1339; Peace with France, May 8, 1369

→ with France 1368

→ civil, 1400; Peace with France, May 31, 1420

→ with France, 1422; civil, between York and Lancaster, 1452; Peace with France, Oct. 1471

→ civil 1486

→ with France, Oct. 6, 1492; Peace with Ditto, Nov. 3, following; Peace with Scotland 1542

→ with Scotland directly after; Peace with France and Scotland, June 7, 1546

→ with Scotland 1547

War

War with France, 1549 ;
 . Peace with both, Mar.
 6 1550
 — civil 1553
 — with France, June 7
 1557
 — with Scotland, 1557 ;
 Peace with France,
 April 2, 1559 ; with
 Scotland 1560
 — with France, 1562 ;
 Peace with Ditto 1564
 — with Scotland 1570
 — with Spain, 1588 ;
 Peace with Spain, Aug.
 18 1604
 — with Spain 1624
 — with France, 1627 ;
 Peace with Spain and
 France, Apr. 14 1629
 — civil 1642
 — with the Dutch, 1651 ;
 Peace with Ditto, Apr.
 5 1654
 — with Spain, 1655 ;
 Peace with Ditto, Sep.
 10 1660
 — with France, Jan. 26
 1666
 — with Denmark, Oct.
 19, following ; Peace
 with France, the Danes,
 and the Dutch, Aug.
 24, 1667 ; Ditto with
 Spain, Feb. 13 1668
 — with the Algerines,
 Sept. 6, 1669 ; Peace
 with Ditto, Nov. 19
 1671
 — with the Dutch, Mar.
 1672 ; Peace with Dit-
 to, Feb. 28 1674
 — with France, May 7,
 1689 ; general Peace,
 Sept. 26 1697
 — with France, May 4,
 1702 ; Peace of U-
 trecht, May 13 1713
 — with Spain, Dec. 1718 ;
 Peace with Ditto 1721
 — with Spain 1719
 — with France, March
 31, 1744 ; Peace with
 France, &c. 1748
 — with France 1756

War with Spain, Jan. 4,
 1764 ; Peace with
 France and Spain, Feb.
 10 1765

William I. Duke of Nor-
 mandy, paid a Visit to
 Edward the Confessor
 in England, 1051 ; be-
 trothed his Daughter
 to Harold II. 1058 ;
 made a Claim of the
 Crown of England,
 1068 ; invaded Eng-
 land by landing at Pe-
 vensey in Sussex ; de-
 feated the English at
 Hastings, October 14,
 1066, where King Ha-
 rold was slain ; crowned
 at Westminster, Dec.
 26 ; invaded Scotland,
 1072 ; subverted the
 English Constitution,
 1074 ; wounded by his
 Rebel Son Robert, at
 Gerberot in Norman-
 dy, 1079 ; invaded
 France, 1088 ; soon
 after which he fell from
 his Horse and contract-
 ed a Rupture, of which
 he died at Hermentrude,
 near Rean, aged 63 ; he was buried
 at Caen, and was suc-
 ceeded ; in Normandy,
 by his eldest Son Ro-
 bert, and in England
 by his 2d Son, Wil-
 ham II.

William II. crowned at
 Westminster, Sept. 27,
 1088 ; invaded Nor-
 mandy, 1090, with
 Success ; killed by Ac-
 cident, as he was hunt-
 ing in the new Forest,
 by Sir Walter Tyrrel,
 August, 1100, aged
 40 ; he was buried at
 Winchester, and suc-
 ceeded by his Brother,
 Henry I.

William III. crowned with
 his Queen, April 11,

1689 ; landed at Car-
 rickfergus, June 14,
 1690 ; fell from his
 Horse and broke his
 Collar-bone, Feb. 22,
 1702 ; died, aged 51,
 March 8, and was bu-
 ried Apr. 10, follow-
 ing, and left his Sister-
 in-Law, Anne, Suc-
 cessor to the Throne.

Winchester burnt 1106
Windsor-Castle built by
Edward III. 1344

Woburn, in Bedfordshire,
 burnt 1724

Wolsey appointed Minister
 to Henry VIII. in
 1513 ; Archbishop of
 York, 1514 ; Cardi-
 nal, 1515 ; Chancel-
 lor, Dec. 24, follow-
 ing ; appointed Le-
 gate, 1518 ; resigned
 the Seals, Oct. 18,
 1529 ; stripped of all
 his Dignities and Offi-
 ces the November fol-
 lowing ; and died, Nov.
 28, 1530, aged 59.

Worcester City burnt 1113
 Y.

York, Richard, Duke of,
 made Protector of this
 Kingdom, March 27,
 1544 ; declared right
 Heir to the Crown,
 1460 ; slain at the
 Battle of Wakefield
 1460

Z.

*Zanxi, the Painter, flou-
 rished* 1468

* * * The foregoing three
 Chronicles, in Pal. for
 1772, 1773, & 1774, are
 a Plan for forming a Chro-
 nological Dictionary, at
 near the Truth as possible ;
 which is a Book worthy
 the Bookellers undertaking,
 as no Book is more wanted,
 for its Usefulness, in the
 whole Republic of Litera-
 ture and Science.

THE BRITISH PALLADIUM, OR							
EMPERORS of ROME, from the Foundation thereof, 753 Years before Christ.							
Began to reign.		Began to reign.					
Yrs. b. Xt.	Y. M. D.	Yrs. b. Xt.	Y. M. D.				
753	Romulus, first King	37	0 0	251	Hosilianus	0	18 0
716	Interregnum of more than 1	0	0		L. Priscus Tyran.		
715	Numa Pompilius	43	0 0		Jul. Valer. Tyran.		
672	Tullus Hostilius	22	0 0		M. Aufidius Perenna, Tyran.		
669	The Battle of the Horatii & Curiatii.				Trebonianus Gallus		
640	Ancus Martius	24	0 0		Vibius Volusianus		
616	Tarquin the elder	38	0 0	253	C. Jul. Emilianus	0	3 0
578	Servius Tullius	44	0 0	253	Licin. Valerianus, Father	0	7 0
534	Tarquin the Proud	25	0 0	253	Lic. Egnat. Gallienus, Son		
509	The Republic of Rome for 478	0	0		of Valerianus, alone	8	0 0
46	Julius Cæsar, Emperor	15	0 0		Licin. Valerianus, Son of Valerianus		
31	Augustus	44	0 0		Licin. Saloninus, Son of Gallienus		
214	Tiberius	22	6 23		Sulpitius Antoninus		
37	Caligula	3	10 8	268	M. Aur. Clau. Gothicus	2	0 0
41	Claudius	13	8 19		Quintillus, Bro. of Claud.	0	0 17
54	Nero	13	7 28		Domit. Aurelianus	4	9 0
	L. Clodius Macer. Tyran.				Firminus, Tyrant in Egypt.		
68	Galba	0	7 0		Tetricus, Tyrant among the Greeks.		
69	Otho	0	3 0		Athenodorus		
69	Vitellius	0	8 5		Heroias, Vabalathus		
69	Vespasian	9	11 24		A. Septimus		
79	Titus	2	2 20	275	Interregnum of	0	8 0
81	Domitian	15	0 5	275	Tacitus	0	7 0
96	Nerva	0	16 8	276	Florianus	0	3 0
98	Trajan	19	6 15	276	Probus	6	4 0
117	Adrian	20	11 0		Saturinus, Proculus, Bonofius.		
138	Antonius Pius	22	7 26	282	M. Aurel. Carus		
161	M. Aurel.	19	10 0		M. Aurel. Carinus		
161	L. Verus	9	0 0		Numerianus	2	0 0
180	Commodus	12	9 14	284	M. Aur. Julian. Sabinus.		
193	Pertinax	0	2 28		Dioclesian & Max. Herc.	20	5 13
193	Didius Julianus	0	2 5		Selvinus, Amendus, Pamponius, Elianus,		
193	Pescennius Niger	1	0 more.		Caranus, Allectus, Epideus Achilleus,		
	Clodius Albinus.				Domitius, Domitianus, Tyrants.		
193	S. Severus	17	8 3	305	Constan. Chlorus, &	0	15 0
211	M. Aurel. Antoninus	6	2 4		Galer. Val. Maximianus	6	0 0
211	P. Septimus Geta	1	0 0		Flav. Valer. Severus		
217	M. Apel. Sev. Macrinus	1	1 27		C. Gal. Val. Maximinus		
218	M. Aur. Ant. Elagabalus	3	9 4		M. Aur. Val. Maxentius		
222	Alexander Severus	13	0 0		Alexander, Tyrant.		
	Pranius Tyran.				P. Val. Lic. Licinius Cæsar		
235	C. Jul. Verus Maximus	3	0 0		Valerius Valens		
237	M. A. G. Africanus, elder	0	2 0		Martinianus		
	M. A. G. Afric. younger	0	2 0	337	Constantine the great	30	9 28
237	Pupienus & Balbinus	1	0 0		— younger, died in 340	3	0 0
238	Gordian III.	5	8 0		Constance	24	5 22
244	Philippus, Father	5	0 0		Saturnius		
	Philippus, Son				Constant	13	0 0
	T. Jul. Mar. Pacatianus				Magnentius & Nepotianus, Varranion &		
	P. Servilius Marinus				Sylvanus, Tyrants.		
249	Decius	2	0 0	361	Julian the Apostate	1	7 23
	Herennius, Etruscus			363	Jovian, Emperor	0	7 20
After this Time the Roman Empire was divided into Eastern & Western.				The			

ANNUAL MISCELLANY, 1774.

21

The first and last KINGS of foreign KINGDOMS, as far as they are known.

Began to reign.

FRANCE.

8414 Clodion.

1715 Lewis XV. born February 15, 1710.

HUNGARY.

373 Attila.

BOHEMIA.

1086 Wratisslas II. had first the Title of King.

The two Kingdoms united, 1612, under Matthias.

Maria Teresa, Dowager Empress of Germany, born May 13, 1717.

ORANGE. William V. born March 2, 1742.

POLAND.

999 Boleslaus had first the Title of King.

1764 Stanislaus, born January 17, 1732.

PRUSSIA.

1700 Frederic.

1740 Frederic III. born January 24, 1712.

SWEDEN.

481 Swartmanus.

Adolphus Frederic, born May 14, 1710.

DENMARK.

NORWAY.

714 Gormo.

998 Suenon.

The two Kingdoms united under Eric IX. in 1482.

1766 Christian VII. born January 29, 1749.

PORTUGAL.

1088 Henry, first Earl.

1112 Alphonsa, the first who had the Title of King.

1750 Joseph, born June 6, 1714.

CASTILE.

ARRAGON.

1033 Ferdinand.

1034 Ramerus.

The two Kingdoms united under Philip I. of Austria, in 1504, and called

SPAIN.

1759 Charles III. born January 20, 1716.

GERMANY.

843 Lewis, the first King.

900 Hugh, the first Emperor.

1765 Joseph Benedict, born March 13, 1743.

RUSSIA.

1533 John Basilowits, the first Czar.

1762 Catharine II. born March 28, 1729.

SARDINIA.

1730 Emanuel III. born April 27, 1701.

NAPLES and SICILY.

1102 Roger.

1759 Ferdinand IV. born January 12, 1751.

ROME.

1769 Clement XIV. born October 31, 1705.

CONSTANTINOPLE.

1298 Ottoman.

1757 Mustapha III. born December 21, 1715.

VENICE.

697 P. L. Ansestus, the first Doge.

1765 Francis Maric Gaeton.

LORRAIN.

958 Frederic, the first Duke.

SAVOY.

1103 Amadeus, the first Earl.

1188 Thomas, the first Duke. The present Duke is King of Sardinia.

GRAMMATICAL TABLE of the RADICALS and ENDINGS
 OF OUR USUAL PATTERN LATIN VERBS, for the FORMATION
 OF all regular LATIN VERBS, active and passive, through the four
 CONJUGATIONS.

ACTIVE VOICE.

I. CONJUGATION.

m-a.
 m-a-bam.
 m-a-v-i.
 m-a-v-eram.
 m-a-bo.
 m-a.
 m-am.
 m-a-rem.
 m-a-v-erim.
 m-a-v-issim.

11. Am-a-v-ero.
12. Am-a-re. *Infinitive.*
13. Am-a-v-isse.
14. Am-a-tu-rum esse vel fuisse.
15. Am-a-n-di, do, dum. *Gerund.*
16. Am-a-t-um, } *Supines.*
17. Am-a-tu-s, }
18. Am-a-ns, }
19. Am-a-t-us, } *Participles.*
20. Am-a-tu-rus, }
21. Am-a-n-dus, }

II. CONJUGATION.

Doc-eo.
 Doc-e-bam.
 Doc-e-i.
 Doc-e-ram.
 Doc-e-bo.
 Doc-e.
 Doc-e-am.
 Doc-e-rem.
 Doc-e-erim.
 Doc-e-issim.

22. Doc-u-ero.
23. Doc-e-re. *Infinitive.*
24. Doc-u-isse.
25. Doc-t-urum esse vel fuisse.
26. Doc-t-en-di, do, dum. *Gerund.*
27. Doc-t-um, } *Supines.*
28. Doc-tu-s, }
29. Doc-t-us, } *Participles.*
30. Doc-tu-rus, }
31. Doc-t-en-dus, }

III. CONJUGATION.

Leg-o.
 Leg-i-bam.
 Leg-i.
 Leg-er-am.
 Leg-am.
 Leg-a.
 Leg-am.
 Leg-er-am.
 Leg-er-im.
 Leg-issim.

32. Leg-ero.
33. Leg-ere. *Infinitive.*
34. Leg-isse.
35. Leg-en-di, do, dum. *Gerund.*
36. Leg-t-um, } *Supines.*
37. Leg-tu-s, }
38. Leg-ens, }
39. Leg-t-us, } *Participles.*
40. Leg-tu-rus, }
41. Leg-en-dus, }

IV. CONJUGATION.

Aud-i-o.
 Aud-i-o-bam.
 Aud-i-o-h.
 Aud-i-o-er-am.
 Aud-i-a-m.
 Aud-i-o.
 Aud-i-am.
 Aud-i-er-am.
 Aud-i-er-im.
 Aud-i-ssim.

42. Aud-i-ero.
43. Aud-i-re. *Infinitive.*
44. Aud-i-isse.
45. Aud-i-turum esse vel fuisse.
46. Aud-i-en-di, do, dum. *Gerund.*
47. Aud-i-t-um, } *Supines.*
48. Aud-i-tu-s, }
49. Aud-i-ens, }
50. Aud-i-t-us, } *Participles.*
51. Aud-i-tu-rus, }
52. Aud-i-en-dus, }

PASSIVE VOICE.

I. CONJUGATION.

- | | |
|-----------------------------|---------------------------------|
| Ind. 1. Am-or. | 8. Amá-rer. |
| 2. Amá-bar. | 9. Amát-us sim vel fuerim. |
| 3. Amát-us sum vel fui. | 10. Amát-us essem vel fuisset. |
| 4. Amát-us eram vel fueram. | 11. Amát-us ero vel fuero. |
| 5. Amá-bor. | 12. Am-ári. <i>Infinitive</i> . |
| Imp. 6. Am-áre. | 13. Amát-um esse vel fuisse. |
| Pot. 7. Am-er. | 14. Amát-um iri. |

II. CONJUGATION.

- | | |
|-----------------------------|----------------------------------|
| Ind. 1. Doce-or. | 8. Docé-rer. |
| 2. Docé-bar. | 9. Doct-us sim vel fuerim. |
| 3. Doct-us sum vel fui. | 10. Doct-us essem vel fuisset. |
| 4. Doct-us eram vel fueram. | 11. Doct-us ero vel fuero. |
| 5. Docé-bor. | 12. Doc-éri. <i>Infinitive</i> . |
| Imp. 6. Doc-ére. | 13. Doct-um esse vel fuisse. |
| Pot. 7. Dote-ar. | 14. Doct-um iri. |

III. CONJUGATION.

- | | |
|-----------------------------|--------------------------------|
| Ind. 1. Leg-or. | 8. Lége-rer. |
| 2. Legé-bar. | 9. Lect-us sim vel fuerim. |
| 3. Lect-us sum vel fui. | 10. Lect-us essem vel fuisset. |
| 4. Lect-us eram vel fueram. | 11. Lect-us ero vel fuero. |
| 5. Leg-ar. | 12. Leg-i. |
| Imp. 6. Lég-ere. | 13. Lect-um esse vel fuisse. |
| Pot. 7. Leg-ar. | 14. Lect-um iri. |

IV. CONJUGATION.

- | | |
|------------------------------|----------------------------------|
| Ind. 1. Aud-ior. | 8. Audi-rer. |
| 2. Audié-bar. | 9. Audit-us sim vel fuerim. |
| 3. Audit-us sum vel fui. | 10. Audit-us essem vel fuisset. |
| 4. Audit-us eram vel fueram. | 11. Audit-us ero vel fuero. |
| 5. Audi-ar. | 12. Aud-iri. <i>Infinitive</i> . |
| Imp. 6. Aud-ire. | 13. Audit-um esse vel fuisse. |
| Pot. 7. Audi-ar. | 14. Audit-um iri. |

References to the Moods, Tenses, and Persons, by the same Numbers. Active and Passive Voice.

- | | |
|--|---|
| 1. Indicative Mood, Present Tense. | 8. Potential, Preterimperfect Tense. |
| 2. ——— Preterimperfect ——— | 9. ——— Preterperfect ——— |
| 3. ——— Preterperfect ——— | 10. ——— Pluperfect ——— |
| 4. ——— Pluperfect ——— | 11. ——— Future ——— |
| 5. ——— Future ——— | 12. Infinitive Mood, Present and Preterimperfect. |
| 6. Imperative Mood. | 13. ——— Preterperfect and Pluperfect. |
| 7. Potential (Optative and Subjunctive) Mood, Present Tense. | 14. ——— Future. |
| 15. Gerund. | |
| 16 & 17. Supine. | |
| 18. Participle of the present Tense. | |
| 19. ——— Preterperfect in us. | |
| 20. ——— Future in us. | |
| 21. ——— Future in du. | |

These References belong to the Active Voice only.

Passive Voice only.

P. 24. Against 27, write *Passive*, (understood for general Reference.)

A SHORT GRAMMATICAL TABLE of the RADICALS and ENDINGS of the FOUR USUAL PATTERN LATIN VERBS, for the FORMATION of all regular LATIN VERBS, active and passive, through the four CONJUGATIONS.

ACTIVE VOICE.

I. CONJUGATION.

Ind.	1. Am- ~~o~~ .	12. Amáv- ~~ero~~ .
	2. Amá-bam.	13. Am- ~~are~~ . <i>Infinitive.</i>
	3. Amáv-i.	14. Amáv- ~~isse~~ .
	4. Amáv-eram.	15. Amát-um esse vel fuisse.
	5. Amá-bo.	16. Amár-di, do, dum. <i>Gerund.</i>
Imp.	6. Am-a.	17. Amát-um, } <i>Supines.</i>
Pot.	7. Am-em.	18. Am- ~~as~~ ,
	8. Amá-rem.	19. Amát-us, } <i>Participles.</i>
	9. Amáv-erim.	20. Amátú-rus,
	10. Amáv- ~~issem~~ .	21. Amán-dus,

II. CONJUGATION.

Ind.	1. Doc- ~~eo~~ .	12. Doc- ~~ere~~ . <i>Infinitive.</i>
	2. Docé-bam.	13. Docu- ~~isse~~ .
	3. Docu-i.	14. Doct-urum esse vel fuisse.
	4. Docu-eram.	15. Docén-di, do, dum. <i>Gerund.</i>
	5. Docé-bo.	16. Doct-um, } <i>Supines.</i>
Imp.	6. Doc-e.	17. Doct-u,
Pot.	7. Doce-am.	18. Doc- ~~ens~~ ,
	8. Docé-rem.	19. Doct-us, } <i>Participles.</i>
	9. Docu-erim.	20. Doctú-rus,
	10. Docu- ~~issem~~ .	21. Docén-dus,

III. CONJUGATION.

Ind.	1. Leg- ~~o~~ .	12. Lég- ~~ere~~ . <i>Infinitive.</i>
	2. Legé-bam.	13. Leg- ~~isse~~ .
	3. Leg-i.	14. Lect-urum esse vel fuisse.
	4. Lég-crath.	15. Legén-di, do, dum. <i>Gerund.</i>
	5. Leg-am.	16. Lect-um, } <i>Supines.</i>
Imp.	6. Leg-e.	17. Lect-u,
Pot.	7. Leg-am.	18. Leg- ~~ens~~ ,
	8. Lége-rem.	19. Lect-us, } <i>Participles.</i>
	9. Lége-rim.	20. Lectú-rus,
	10. Leg- ~~issem~~ .	21. Legén-dus,

IV. CONJUGATION.

Ind.	1. Audí- ~~o~~ .	12. Aud- ~~ire~~ . <i>Infinitive.</i>
	2. Audié-bam.	13. Audiv- ~~isse~~ .
	3. Audív-i.	14. Audit-urum esse vel fuisse.
	4. Audív-eram.	15. Audien-di, do, dum. <i>Gerund.</i>
	5. Audi-am.	16. Audit-um, } <i>Supines.</i>
Imp.	6. Aud-i.	17. Audit-u,
Pot.	7. Audi-am.	18. Aud- ~~iens~~ ,
	8. Audi-rem.	19. Audit-us, } <i>Participles.</i>
	9. Audív-erim.	20. Auditú-rus,
	10. Audiv- ~~issem~~ .	21. Audien-dus,

PASSIVE

PASSIVE VOICE.

I. CONJUGATION.

- | | |
|-----------------------------|---------------------------------|
| Ind. 1. Am-or. | 8. Amá-rer. |
| 2. Amá-bar. | 9. Amát-us sim vel fuerim. |
| 3. Amát-us sum vel fui. | 10. Amát-us essem vel fuisset. |
| 4. Amát-us eram vel fueram. | 11. Amát-us ero vel fuero. |
| 5. Amá-bor. | 12. Am-ári. <i>Infinitive</i> . |
| Imp. 6. Am-äre. | 13. Amát-um esse vel fuisse. |
| Pot. 7. Am-er. | 14. Amát-um iri. |

II. CONJUGATION.

- | | |
|------------------------------|----------------------------------|
| Ind. 1. Doce-or. | 8. Docé-rer. |
| 2. Docé-bar. | 9. Docét-us sim vel fuerim. |
| 3. Docét-us sum vel fui. | 10. Docét-us essem vel fuisset. |
| 4. Docét-us eram vel fueram. | 11. Docét-us ero vel fuero. |
| 5. Docé-bor. | 12. Doc-ári. <i>Infinitive</i> . |
| Imp. 6. Doc-äre. | 13. Docét-um esse vel fuisse. |
| Pot. 7. Dote-ar. | 14. Docét-um iri. |

III. CONJUGATION.

- | | |
|----------------------------|--------------------------------|
| Ind. 1. Leg-or. | 8. Lége-rer. |
| 2. Legé-bar. | 9. Lect-us sim vel fuerim. |
| 3. Lectus sum vel fui. | 10. Lect-us essem vel fuisset. |
| 4. Lectus eram vel fueram. | 11. Lect-us ero vel fuero. |
| 5. Leg-ar. | 12. Leg-i. |
| Imp. 6. Lég-ere. | 13. Lect-um esse vel fuisse. |
| Pot. 7. Leg-ar. | 14. Lect-um iri. |

IV. CONJUGATION.

- | | |
|------------------------------|----------------------------------|
| Ind. 1. Aud-ior. | 8. Audi-rer. |
| 2. Audié-bar. | 9. Audit-us sim vel fuerim. |
| 3. Audit-us sum vel fui. | 10. Audit-us essem vel fuisset. |
| 4. Audit-us eram vel fueram. | 11. Audit-us ero vel fuero. |
| 5. Audi-ar. | 12. Aud-iri. <i>Infinitive</i> . |
| Imp. 6. Aud-ire. | 13. Audit-um esse vel fuisse. |
| Pot. 7. Audi-ar. | 14. Audit-um iri. |

References to the Moods, Tenses, and Persons, by the same Numbers. Active and Passive Voice.

- | | |
|--|---|
| 1. Indicative Mood, Present Tense. | 8. Potential, Preterimperfect Tense. |
| 2. — Preterimperfect — | 9. — Preterperfect — |
| 3. — Preterperfect — | 10. — Pluperfect — |
| 4. — Pluperfect — | 11. — Future — |
| 5. — Future — | 12. Infinitive Mood, Present and Preterimperfect. |
| 6. Imperative Mood. | 13. — Preterperfect and Pluperfect. |
| 7. Potential (Optative and Subjunctive) Mood, Present Tense. | 14. — Future. |
| 15. Gerunds. | |
| 16 & 17. Supines. | |
| 18. Participle of the present Tense. | |
| 19. — Preterperfect in us. | |
| 20. — Future in rus. | |
| 21. — Future in rus. | |

These References belong to the Active Voice only.

Passive Voice only.

P. 24. Against 27, write *Passive*, (understood for general Reference.)

A SHORT GRAMMATICAL TABLE of the several TERMINATIONS of all regular LATIN VERBS, active and passive, through the several MOODS and TENSES in the four CONJUGATIONS.

ACTIVE VOICE.

<i>Singular.</i>				<i>Plural.</i>			
<i>Persons. I. I.</i>	<i>II. Thou.</i>	<i>III. He.</i>		<i>I. We.</i>	<i>II. Ye.</i>	<i>III. They.</i>	<i>Conj.</i>
<i>Ind. 1.</i>	<i>o</i>	<i>as</i>	<i>at</i>	<i>ámus</i>	<i>átis</i>	<i>ant.</i>	<i>1.</i>
	<i>co</i>	<i>es</i>	<i>et</i>	<i>émus</i>	<i>étis</i>	<i>ent.</i>	<i>2.</i>
	<i>o</i>	<i>is</i>	<i>it</i>	<i>imus</i>	<i>itis</i>	<i>unt.</i>	<i>3.</i>
	<i>io</i>	<i>is</i>	<i>it</i>	<i>imus</i>	<i>itis</i>	<i>iunt.</i>	<i>4.</i>
<i>2.</i>	<i>bam</i>	<i>bas</i>	<i>bat</i>	<i>bámus</i>	<i>bátis</i>	<i>bant.</i>	<i>1.2.3.4.</i>
<i>3.</i>	<i>i</i>	<i>isti</i>	<i>it</i>	<i>imus</i>	<i>istis</i>	<i>erunt, ére.</i>	<i>Ditto.</i>
<i>4.</i>	<i>erath</i>	<i>eras</i>	<i>erat</i>	<i>erámds</i>	<i>erátis</i>	<i>erant.</i>	<i>Ditto.</i>
<i>5.</i>	<i>bo</i>	<i>bis</i>	<i>bit</i>	<i>bimus</i>	<i>bitis</i>	<i>bunt.</i>	<i>1.2.</i>
	<i>ant</i>	<i>es</i>	<i>et</i>	<i>émus</i>	<i>étis</i>	<i>ent.</i>	<i>3.4.</i>
<i>Imp. 6.</i>	—	<i>a, áto</i>	<i>et, áto</i>	<i>émus</i>	<i>áte, atóte</i>	<i>ent, anto.</i>	<i>1.</i>
	—	<i>c, éto</i>	<i>eat, éto</i>	<i>eámus</i>	<i>éte, etóte</i>	<i>esnt, ento.</i>	<i>2.</i>
	—	<i>e, ito</i>	<i>at, ito</i>	<i>ámus</i>	<i>ite, itóte</i>	<i>ant, unto.</i>	<i>3.</i>
	—	<i>i, íto</i>	<i>ist, íto</i>	<i>iámus</i>	<i>íte, ítóte</i>	<i>iant, iunto.</i>	<i>4.</i>
<i>Pot. 7.</i>	<i>em</i>	<i>es</i>	<i>et</i>	<i>émus</i>	<i>étis</i>	<i>ent.</i>	<i>1.</i>
	<i>am</i>	<i>as</i>	<i>at</i>	<i>ámus</i>	<i>átis</i>	<i>ant.</i>	<i>2.3.4.</i>
<i>8.</i>	<i>réra</i>	<i>res</i>	<i>ret</i>	<i>rémus</i>	<i>rétis</i>	<i>rent.</i>	<i>1.2.3.4.</i>
<i>9.</i>	<i>erim</i>	<i>eris</i>	<i>erit</i>	<i>érimus</i>	<i>éritis</i>	<i>erint.</i>	<i>1.2.3.4.</i>
<i>10.</i>	<i>issim</i>	<i>isses</i>	<i>isset</i>	<i>issémus</i>	<i>issétis</i>	<i>issent.</i>	<i>1.2.3.4.</i>
<i>11.</i>	<i>ero</i>	<i>eris</i>	<i>erit</i>	<i>érimus</i>	<i>éritis</i>	<i>erint.</i>	<i>1.2.3.4.</i>

PASSIVE VOICE.

<i>Singular.</i>				<i>Plural.</i>			
<i>I. I.</i>	<i>II. Thou.</i>	<i>III. He.</i>		<i>I. We.</i>	<i>II. Ye.</i>	<i>III. They.</i>	<i>Conj.</i>
<i>Ind. 1.</i>	<i>or</i>	<i>áris vel áre</i>	<i>átur</i>	<i>ámur</i>	<i>ámini</i>	<i>ántur.</i>	<i>1.</i>
	<i>er</i>	<i>éris vel ére</i>	<i>étur</i>	<i>émur</i>	<i>émini</i>	<i>éntur.</i>	<i>2.</i>
	<i>or</i>	<i>eris vel ere</i>	<i>itur</i>	<i>imur</i>	<i>imini</i>	<i>úntur.</i>	<i>3.</i>
	<i>ior</i>	<i>íris vel íre</i>	<i>ítur</i>	<i>imur</i>	<i>imini</i>	<i>iúntur.</i>	<i>4.</i>
<i>2.</i>	<i>bar</i>	<i>báris v. bäre</i>	<i>bátur</i>	<i>bámur</i>	<i>bámini</i>	<i>bántur.</i>	<i>1.2.3.4.</i>
<i>5.</i>	<i>bor</i>	<i>beris v. bere</i>	<i>bitur</i>	<i>bimur</i>	<i>bimini</i>	<i>búntur.</i>	<i>1.2.</i>
	<i>ar</i>	<i>éris vel ére</i>	<i>étur</i>	<i>émur</i>	<i>émini</i>	<i>éntur.</i>	<i>3.4.</i>
<i>Imp. 6.</i>	—	<i>áre, átor</i>	<i>étur, átor</i>	<i>émur</i>	<i>ámin-i, or</i>	<i>éntur, ántor.</i>	<i>1.</i>
	—	<i>ére, étor</i>	<i>eátur, étor</i>	<i>eámur</i>	<i>émin-i, or</i>	<i>eántur, éntor.</i>	<i>2.</i>
	—	<i>ere, itor</i>	<i>átur, itor</i>	<i>ámur</i>	<i>imin-i, or</i>	<i>ántur, úntur.</i>	<i>3.</i>
	—	<i>íre, ítor</i>	<i>látur, ítor</i>	<i>iámur</i>	<i>imin-i, or</i>	<i>iantur, iúntur.</i>	<i>4.</i>
<i>Pot. 7.</i>	<i>er</i>	<i>éris vel ére</i>	<i>étur</i>	<i>émur</i>	<i>émini</i>	<i>éntur.</i>	<i>1.</i>
	<i>ar</i>	<i>áris vel áre</i>	<i>átur</i>	<i>ámur</i>	<i>ámini</i>	<i>ántur.</i>	<i>1.2.3.</i>
<i>8.</i>	<i>res</i>	<i>réris v. rére</i>	<i>rétur</i>	<i>rémur</i>	<i>rémini</i>	<i>réntur.</i>	<i>1.2.3.4.</i>

ACTIVE VOICE.

1. I love, or do love.
2. I loved, or did love.
3. I have loved.
4. I had loved.
5. I shall or will love.
6. Love thou.
7. I may or can love.
8. I might (would, should, or could) love.
9. I might (would, should, or could) have loved.
10. I might (would, should, or could) have had loved.
11. I shall have loved.
12. To love.
13. To have or have had loved.
14. To be about to love.
15. Of

15. Of loving, in loving, to love.
16. To love.
17. To be loved.
18. Loving.
19. Loved.
20. About to love.
21. To be loved.

PASSIVE VOICE.

- | | |
|--|--|
| 2. I am loved. | 9. I may (might, would, should) have loved. |
| 3. I was loved. | 20. I might (would, should, or could) have had been loved. |
| 4. I have been loved. | 21. I shall have been loved. |
| 5. I had been loved. | 22. To be loved. |
| 6. I shall or will be loved. | 23. To have been loved. |
| 7. Be thou loved. | 24. To be about to be loved. |
| 8. I may or can be loved. | |
| 3. I might (would, should, or could) be loved. | |

N B. The four Verbs active, $\left\{ \begin{array}{l} \text{Am-o, to love,} \\ \text{Doc-co, to teach,} \\ \text{Leg-o, to read,} \\ \text{Aud-io, to hear,} \end{array} \right\} \left\{ \begin{array}{l} 1 \\ 2 \\ 3 \\ 4 \end{array} \right\} \left\{ \begin{array}{l} \text{Conjugat} \\ \text{for Patterns,} \\ \text{to} \end{array} \right\}$ are preferred, $\left\{ \begin{array}{l} \text{Am-o, to love,} \\ \text{Mon-co, to advise,} \\ \text{Reg-o, to govern,} \\ \text{Aud-io, to hear:} \end{array} \right\}$

The former four being the *shorter Sound*, and denote the *plainer and perfecter Ideas*. — Though the Ending of the Supine, *-itum*, in *Mon-itum*, (from the first Ending, *co*,) is more general than *tum*, in the Supine, *Doc-tum*. And the *Present Perfect Tense*, *Rex-i*, (from the Ending, *ge*, in the 3d Conjugation, 1st Person, Present Tense,) more general than *Leg-i*, from *Lego*. Exceptions to general Rules are too many to be *all enumerated*; and, since all *Latin Verbs* must be declined, the short and familiar *Exceptions* may be used for Patterns, according to *Lily's Originals*, instead of *barbarous* or *unusual Regulars*, introduced by *Rival Grammarians* for selfish Ends.

EXAMPLE I. ACTIVE VOICE.

Required the first Person Plural, Imperative Mood, Active Voice, of *Amo*, to love, first Conjugation.

Against the *referential Numbers*, Imperative Mood, active Voice, stands 6; look for 6, where *Amo* stands, under the first Conjugation, and you will find *Amate*; take the Radical, *Am-*, and join it to the Termination, *-mus*, standing against 6 in the Termination-Page, and it will make *Amemus*, let us love. Answer.

EXAMPLE II. PASSIVE VOICE.

Required the third Person singular, Indicative Mood, passive Voice, of *Delecto*, to delight, first Conjugation.

Against the *referential Numbers*, Indicative Mood, Future Tense, 1st Conjugation, passive Voice, stands 11, against the Pattern Verb, *Am-atus ero vel fuero*, whence *Am-atus erit vel fuerit* is the 3d Person singular, (by the Auxiliary, *sum*, whose Declining will be shewn.) Whence, instead of the Radical, *Am-*, put *Delect-*, and it will be *Delectatus fuerit*, He shall have been delighted, or, He shall be delighted hereafter. Answer.

* * For declining irregular and defective Verbs, and for a more general and perfect Exemplification of the Formation of Latin Verbs, from their Radicals and four Pattern Verbs, we refer to our Short Latin Grammar to be published hereafter.

PART II.

ANSWERS to all the *ÆNIGMAS* in last Year's PALLADIUM.

- | | | |
|-------------------|---------------------------|-------------------|
| I. The Letter D. | VI. A KEY. | X. A POPE'S BULL. |
| II. PIT-COAL. | VII. MADAM. | XI. EVIL. |
| III. SHOES. | VIII. A WARM-
ING-PAN. | XII. BELLAWS. |
| IV. A PLANE. | IX. The 9 FIGURES. | XIII. STILTS. |
| V. An HOUR-GLASS. | Prize. A CRIBBAGE-BOARD. | |

All the ÆNIGMAS answered by Rurilindus to Rurilinda.

O THOU! adorn'D with each attractive Grace,
A virtuous Mind and Soul-enchanting Face!
Whose lovely Form surrounding Crowds admire,
Whose lively Wit does ev'ry Bosom fire!
O hear, for once, your supplicating Swain,
And deign, O deign, to mitigate my Pain! —
Were Crowns and Kingdoms mine to give away,
Or were the World all subject to my Sway,
All, — all, I could with wond'rous Joy resign,
If, by these Means, I might but call you mine. —
Would Heav'n, all-gracious, but assign my Lot
To dwell with you beneath some humble Cot,
There I'd rejoice, if only blest with Health,
And pity all the grov'ling Sons of Wealth. —
With what Delight should I behold the Spring!
How joy to hear the feather'd Warblers sing!
Their rural Strains would more true Joys inspire
Than all the Music of a Handel's Lyre;
For he, with all his most enliv'ning Keys,
Could never like these nat'ral Songsters please.
The lowly Plane, and proud aspiring Hill,
The bubbling Fountain, and the purling Rill,
The painted Flow'rs, and gently-fanning Breeze,
And all Creation would more than usual please. —
Then, Rurilindus, deign to let me love,
And, with a Smile, my Wretchedness remove;
For once let Pity, heav'nly Pity, reign,
And doom me not to spend my Hours in Pain.
But oh! I fear 'tis vain for me to plead,
For, in your Looks, I no *Indulgence* read;
Ne'er from those Lips one tender Word obtain,
My Sighs and all my Eloquence in vain. —
In vain among my Friends I seek Relief;
Their kind Advice does but augment my Grief.
To Books and Figures I've in vain apply'd,
My Heat for Learning seeming to subside.
Sometimes I strive to drown my Cares in Noise,
Where Cribbage, Men, and Stilts employ the Boys,
Prize. 13.
Where

Where *Madam's* seen attended by her Maid,
 With spotless *Skirts* and gaudy Robes array'd;
 But there deep Sorrow hangs upon my Soul,
 And Love still reigns unmindful of Control.
 Beside the Rill that gurgles down the Dale,
 How oft do I my hapless Lot bewail!
 Pour out in Sighs the Anguish of my Mind,
 And pray the heav'nly Pow'r to make you kind!
 The bleating Flocks have often heard my Groans,
 And when I weep soft *Philomela* moans.
 The Blackbird with his sweet melodious Tune,
 And Linnets warbling in the Shades of Noon,
 The Flow'rs enrich'd with various lovely Dyes,
 From whence a Thousand grateful Scents arise,
 Can ne'er, alas! now dissipate the Gloom,
 Or make me mind less of my *Evil* Doom. 11.
 Without Refreshment all the Breezes blow, 12.
 And Echo sighs, responsive, to my Woe. —
 Oh! condescend your faithful Swain to save;
 Oh! snatch me from the Borders of the Grave;
 Oh! let me clasp thee in my longing Arms,
 Pour out my Soul, and feed upon thy Charms;
 Oh! let me press thy lovely Lips to mine,
 And lose my Grief in Raptures half divine!

All the ENIGMAS answered by the Rev. Thomas Vaughan, M. A. at Mospeth.
COAL, Shoes, a Plave, an Hour-Glass, Letter D,
With Madam, Figures, Pope's Bull, and a Key,
Stilts, Beliquis, Cribbage-Board, with Evil, liqs.
 Answers to all th' Enigmas truly give.

All the ENIGMAS answered, in Latin, by Mr. Alexander Rowe.
QUARTA Litore, mea Domina, Pluvula, Delabra, 1. 7. 3. 4.
Carbones minerales, Clavis, Thermoclinium, Malum, Follis, et Clepsydra.
 [2. 6. 8. 11. 12. 5.]

To the PALLADIUM-AUTHOR. By the Rev. Thomas Vaughan, M. A.
On his receiving the Lot of 4 Palladiums, covered with gilt embossed Paper.

FROM *Paris'* Hand when *Venus* did receive
 The famous golden *Apple*, I believe
 Her real Joy not more, on that Decree,
 Than from your *Prize* there was deriv'd to me!
 May the PALLADIUM always bear the Bell,
 And for its Use in Science still excel!
 Then your *Contributors* will Laurels wear,
 And *Is Paeans* sing With Joy each Year!

Answer to the PRIZE-ENIGMA, by Mr. Isaac Gumley.
 I.

YE young and vain, from Mirth refrain,
 And take a Friend's Advice;
 Forbear to play your Time away
 With *Cribbage-Boards* or Dice,

THE BRITISH PALLADIUM, OR

II.

Forbear to think that Noise and Drink
Can drive your Cares away ;
Or gaudy Drest resembles Distress,
And screen you from Decay.

III.

Let Wisdom's Page your Thoughts engage,
Where num'rous Beauties shine,
To fill the Mind with Joys refin'd,
And Raptures all divine !

The same answered by Mr. George Lacey, of Bridport.

WITH eager Eyes the Laurel-Prize
I read, but all in vain ;
More calm I grew ; when to my View
The Cribbage-Board was plain.

Answer to the PRIZE-ÆNIGMA by Philo-Sophia.

EPHRAIM with Sophy once at Cribbage play'd :
You cheat, my Dear, to him she smiling said.
Cheat Thee ! says Ephraim — say not such a Word —
I'd rather cheated be — and burn the Board !

Answer to the PRIZE-ÆNIGMA, by Mr. W. Penn, of Chalfont, Bucks.

OLD Argus with a Hundred Eyes look'd after Io ;
But I, with more twenty-one,* guard chaste Sophia.
* Cribbage-Board Eyes, Number 121.

All the ÆNIGMAS answered by Gemini, of Morpeth.

Addressed to Miss Polly Stow, on Occasion of an extraordinary printed Libel, on the Palladium and its Correspondents, being sent to that young Lady and all the Palladium Correspondents, signed BLOODY BUTCHER.

Dear Miss,

THE Fable of the Toad† you've read,
Where, in a Glass, you've seen display'd,
How one, with Envy swollen and curst,
Aping the Ox, swell'd till he burst !
So envious Scribblers, taking Pains,
Swell till they've burst their little Brains !
Who on Palladiums will comment,
While Ignorance defeats th'Intent.
To School-boy Questions there, conceive,
What Answers can this Master give ?
The Envy rais'd, wise Men detest,
Has brought you into more Request.
The Palladium-Author, Work, and Friends,
The brighter shine by Friction's Means ;
Soot rubb'd o'er Plate still makes it whiter,
And consequently much the brighter.
Of Buttons, Miss, be not afraid,
Nor yet of Hats to deck the Head :
Honours were not for Russians made.
If one's in proper Habit dress'd,
The Clasps and Strings become him best ;

† and Ox.
5.

His Frock with Knife and Steel be hung,
Great Master of the vulgar Tongue !
Obscenity he takes for Sense,
As Modesty is his Offence :
So, Miss, resign him to his Maker,
Pshaw, Sophy, or the modest Quaker !

Ne'er to his Works attempt a <i>Key</i> ,	6.
As he scarce knows a, b, c, <i>D</i> ;	1.
His <i>Evil Deeds</i> are black as <i>Coal</i> ,	11. 2.
The <i>Pope</i> can't pardon Half his Soul ;	10.
His Efforts, <i>Madam</i> , pray disdain,	7-
Who, like bad <i>Bellows</i> , puffs in vain !	12.
His Conscience, like a <i>Cribbage-Board</i> ,	Prize.
'Tis plain has oftentimes been bor'd.	4-
His Rhimes, on <i>Stilts</i> , but hobbling go,	13.
His Sense not worth a cast-off <i>Shoe</i> ,	3-
<i>Figures</i> nor Letters does he know.	9.

But now, dear Miss, I've said enough
About such choice and precious Stuff !
To Worth like your's and H--h's I'll be
A Friend to all Posterity.

I'm, with Regard, your's — GEMINI.

- Mr. Thomas Stuckfield, Schoolmaster, in Whitehorse-Street, Stepney, (near London,) answers the 3d and 11th *ÆNIGMAS*, as follow.

Answer to the 3d. On Matrimony.

HOW happy the Days when in Wedlock we're join'd,
Where Love, Truth, and Honour, in both are combin'd ;
With Raptures each Moment their Bosoms will glow,
Whose Smiles sweet Contentment alone can bestow ;
While she with her Needle her Art does display,
He cheerfully follows the Work of the Day.
Old Time still attends them on gay silken Wing,
And pleasing Reflections still new Raptures bring.
How blest the fond Pair who these Maxims pursue,
And Care sits as easy as any old *Shoe*.

On the 11th.

WHO'D wish to live, nor live in vain,
From Evil Actions must refrain.

Mr. Joseph Hunt, Master of Winslow School, answered all the *Ænigmas* in elegant Verse to Lucinda, but our Room cannot contain all the Merit we receive. Messrs John Wadforth and Wilson, Pupils to Mr. James Lamb, of Aldbury, answered 1, 3, 4, 5, 6, 7, 11, 12, 13, and the Prize *Ænigmas*. Mr. Richard Dakin, 1, 3, 4, 5, 6, 7, 9, 11, 12, and Prize. Mr. Richard Drake, 1, 3, 4, 5, 6, 7, 9, 11, 12, 13. Mr. William Wells, all but 2 and 8 ; Mr. Stephen Hartley, all but 2 and 8 ; Mr. George Lacey, all but 2 and 8 ; a Northumbrian, all but 1, 2, 8 ; Mr. W. Hurne, of Watton, answered the Prize in Verse, all in Prose but 2, 8, 11, 13. Mr. Thomas Jones, of Countesthorpe, answered all in elegant Verse ; as did Mr. W. Jon ; Mr. George Perrot, all but 2, 8, 9, 10 ; Mr. Scot, all but 8, 12 ; Mr. W. Hayes, all but 2, 9, 10, 12, 13, and Prize ; Mr. W. Marsden, all but 2, 8, 12 ; Mr. James Hartley, all but 2, 8, 10. Mr. James Muscroft, 3, 4, 5, 6, 7, 11 ; Mr. W. Penn, 1, 3, 4, 5, 6, 11, 12, 13 ; Mr. Robert Arnold, junior, of Brinsworth, 3, 4, 5, 7, 8, 11, Mr. Potts, all but 8 ; Mr. Ward, Collector, all but 2, 8, 12, 13, and Prize.

• • • We

“We cannot admit of Room for *Ænigmas* on remote Subjects sent us, (like *Ænigmas* made on Subjects in the Moon, or on the *Satellites* of *Jupiter* and *Saturn*,) nor for mean Subjects, or Things incorrectly performed, nor for Others coming too late, not being duly correct and considered. If these Correspondents expect to shine in their Talents, they should be less in a Hurry when they write, and employ that Time and Attention, in the Service of the *Palladium*, they before employ for other periodical Productions. To tell us of their Hurry, or great Business, is so far from being a sufficient Apology for Neglect, that it is an Aggravation of their Failures and Omissions.—Nothing but Things properly considered and finished are admitted into the *Palladium*.”

ANSWERS to the QUERIES in last Year's PALLADIUM.

I. QUERIES 226, answered by Mr. Isaac Gurney, of Countesthorpe.

WHEN *Adam* first beheld his Partner Eve,
Bless'd with more Charms than we can well conceive,
A Warmth unusual glow'd within his Breast,
He kiss'd his Bride, and own'd that he was blest.

Mr. Richard Drake, of the Isle of Wight, answered it in the same Manner.—
Mr. John Milton, of Newport in the Isle of Wight, gave us Milton's elegant Verses in *Paradise Lost*, B. iv. L. 492. ending thus; *And press'd her Matron Lip with Kisses pure.* Mr. Stackfield answered it in two elegant Couplets to the same End.

Mr. Alexander Rowe answers thus.

WHEN plac'd in *Eden*, the first happy Pair
First tasted of the heav'nly Banquet there!

II. QUERIES 227, answered by Mr. Richard Drake.

I think from Scripture it does not
Appear who was the Wife of *Lot*.

Miss M—y, of Newport, at Mr. Nicholson's School in the Isle of Wight, answered it in the same Manner.

III. QUERIES 228, answered by the Proposer, Gemini, of Motpeth.

A Country Woman begg'd a Boon
Of a rich Merchant, here well known;
Who, generous Heart! quite free to all,
Of *Packbread* handed down a Ball,
That measur'd twelve-score Yards — to grant —
And bid her take what she might want.
She talk'd, — roll'd off, — to tire your Patience, —
At last said, 'Here's enough in Conscience.'
The Merchant smil'd; — and said, 'Let's see
'What may a Woman's Conscience be!'
He found it forty Yards in all;
If he'd had none, she'd ta'en the Ball!

Mr. Richard Drake says,

THE Difference is Nothing between what we call

A Conscience that's large, and no Conscience at all.

Miss W—d, of Newport, answered it in the same Manner; as did Mr. Hardy. Mr. John Hart, (or his Pupils,) of Cambo, makes Conscience an ethical Impulse, as it is generally used or understood, without being justified by Sense or Reason: That Conscience will rob a Church to build an Hospital. It often banishes Morality, and admits not Nature, Liberty, or Property, unless

Verse

Verse and Chapter can be shewn for it; making no *Difficulty* in doing the worst of Things, under the *Sanction* of *Conscience*, while it scruples doing the most necessary Offices of a Christian; being no *Conscience* at all. Consequently the large *Conscience* must be, in the Application, only in Opposition to no *Conscience*.

IV. QUERE 229, answered by Mr. Richard Drake, of the Isle of Wight.

ACCORDING to the celebrated Dr. Halley, the Parts of the Earth required lie under the Poles, and when the Sun is in the *two Tropics*, and the Sun in the Zenith. See the *Philosophical Transactions*, Number 203, P. 878.

Miss W—n, of Newport, in the Isle of Wight, says,

THAT the Parts of the Earth are the Poles, does appear;

When the Sun's in the Tropics, the Times of the Year.

Referring to the *Philosophical Transactions*, exactly as above.

Mr. *Alexander Rowe* answers, that when the Sun is in *Cancer* the Heat will be the greatest to all the Inhabitants in every Part of the Northern, and least to those in every Part of the Southern, Hemisphere; and when the Sun is in *Capricorn* the contrary will happen. — But, the Sun always moving in the *Ecliptic*, and the Earth revolving on its Poles towards the Sun, the Places at the Pole, being the most remote, will be generally the coldest; as those at the Equator, being nearest the Sun, will be generally the hottest.

N. B. All Places, parallel to the *Ecliptic*, did the Earth turn on those Poles, would be continually hottest and coldest, or have the same Heat, and there would be no Diversity of Seasons. PALLADIUM-AUTHOR.

V. QUERE 230, answered by Mr. Drake.

BY the Laws of *Hydrostatics*, a less Weight than itself will raise it up; but, in a stagnant or confined Fluid, or one that has a great Degree of *Tenacity*, or if the Body be in close Contact with the Bottom of the containing Vessel, &c. it may require more Weight than itself to raise it up.

Mr. *Hartley* observes as above, at first; but says it will require a greater Weight than itself to force it out; because Part of the Fluid will adhere to it. That, in the Fluid, its Weight will be as the different Density of it and the Fluid.

Mr. *Alexander Rowe* says, to a Force, equal to the Weight of the Body, another Force must be added equal to the Weight of the Column of Fluid, (whose Base is equal to the upper Surface of the immersed Body, and Height equal to the Distance from the said Surface to the Superficies of the Fluid,) until the Fluid insinuates itself under the Body, and acts equally on all its Parts, (or till it is raised a Space equal to its Thickness,) and then a Power equal to its Weight will bring it up.

VI. QUERE 231, answered by Mr. Drake.

IN King Charles the Second's Time, when Sir Robert Holmes, of the Isle of Wight, brought Gold-Dust from the Coast of Guinea, a Guinea first received its Name from that Country.

VII. QUERE 232, answered by the Palladium-Author.

TO pray for Rain in Churches, or elsewhere, appears to be the same as to pray for Snow, dry Weather, or Sunshine, and for such Things as different Peoples Fancies or wrong Judgements, or different Views and vain Imaginations, suggest to them. For, the Operations of Nature are supposed to be universally carried on every where for the Good of the Whole; and if it be true, what Mr. *Pope* says, in his *Ethic Epistle*, there can be no Error in Nature:

In Spite of Pride, in erring Reason's Spite,
One Truth is clear, Whatever is is right.*

*Respecting Nature.

To which may be subjoined,

*Except Man's Will, exempt from Nature's Laws,
In Spite of Doubt, our Good or Evil draws.*

Persons of the same or different Occupations and Interests pray for different elementary Weather at the same Time and Place. So different Armies pray to God for different Successes, or Destructions. And how is it consistent for God to oblige both Parties?

If God's Will be done on Earth as it is in Heaven, (prayed for, in the Lord's Prayer, in Churches,) there is little Occasion for other Solicitations of the divine Power and Goodness, since asking what may be unfit for us will prove a Hurt instead of Benefit; as the Farmer, in the Fable, resigned the Weather into Jupiter's Hands again, when he had enjoyed what Weather he asked for, and found his Crops worse than his Neighbours.

One Part of the Scripture teaches to bless them that curse you, and pray for them that despitefully use you, Libellers, &c. against the Church Doctrines of cursing our Fellow Beings! But though the Texts of Scripture seem to clash with each other in different Places, as the Statute Laws in different Acts of Parliament differ so much as sometimes to require an Adjustment, (like a Hadley's Quadrant,) yet the divine and human Commands, in general, are reconciled by a general Obedience to Morality and Religion, and an Abstinence from Vice and Injustice.

The Irregularities of Man's Race require to be put under Laws and Government, as is evident from their various and irregular Propensities and Inclinations; yet the Deviation of whose Wills from Equity and Justice, with Respect to their Conduct towards one another, is such, that sometimes no Force or Punishment, but cutting them off, is able to restrain their Irregularities and keep them in Order.

The infinitely wise Being, permitting Men's Irregularities, (for Experiment or Probation,) to answer the Ends of his glorious Creation, he can dispose of them here, or remove them from this to another State of Being, as he sees best fit. And since all created Beings are within the Grasp of the divine Power, to do with them the Way most suitable to his Pleasure, therefore to submit (by resigning to his Providence) is the right human Wisdom.

Yet the Race of Mankind (corrupted as it is) is certainly at Liberty to ask of God to grant what is fit and good for their Happiness; and, while they ask, to beg that he would avert or refuse what is against their Happiness, or hurtful to them, though asked.

VIII. QUERE 233, answered by HONESTUS.

TO the first Part of this Quere the Answer is yes. The second or latter Part refers to the worthy and reverend Conductor-General of the Longitude, at his Dormitory, at Greenwich-Observatory; to whom all the Palladium Correspondents, obliged by printed Encomiums from that Quarter, are hereby authorized respectfully, righteously, and righteously, to apply for a direct and proper Answer.

PRIZE-QUERE answered by Investigator.

WHOEVER would wed, should both Parties agree,
For the Good of themselves, and their own Progeny:
A Dissension in either has often been found
Productive of Cuckoos o'er all the World round.
The Husband offended will make his Exchange,
The Wife disoblig'd too will seek her Revenge;
Whence we find in a Nation but Families few
(By ill-matching of Pairs) where the Breed is quite true.*

* Where all the Sons are gallant, and all the Daughters virtuous.

To marry by *Chance* what Hazards Men run,
 Foredoom'd to be *Cuckows* from Father to Son.
 Whils the *nat'ral-born*, who distinguish the *Breed*,
 For a Proof of their *Lineage* have far the less Need.
 The *Virgin*, or *Widow*, who sells her *Freehold*,
 For Love or Esteem, or for Liking or Gold,
 Has *Issue* more certain, more clear, than the *Wife*,
 Where she and the Husband are often at *Strife*.

By *Fluxions* and *Algebra*, *Logarithms* too,
 The *false* and *true born** are as *six* is to *two* ;
 And the *Cuckow-born* Birds to the *nat'ral* by Birth
 Are as *one* is to *ten* throughout the whole Earth ;
 Inverting the *Dastards* to Men of *true Worth*.

In *Spain* is the *Padlock* to lock up the *Prize* ; †
 In *Turkey*, the *Keeper* ‡ to keep off *Surprise* !
 In *China*, *Strait Shoes* § to make *Women* go right ;
 And the *Veil*, in some Places, § keeps Others from *Sight*.
 To keep *Wives* within *Bounds*, in more lewd *Italy*,
 One *Gallant* is allow'd, who is call'd *Cicisbe*. ¶
 In *England*** the *Ladies* all live more at *Ease*,
 Where *Married* and *Single* do just as they please.
 The *Married* and *Single*, above *Mens* *Controul*,
 To *Masquerades* go, or with *Gallants* may stroll.
 So *Sophy*, admir'd, with her *Hat* and *fine Feather*,
 Rides out, without *Deary*, quite safe with *Another*,
 In *fine Silver Habit*, in very *fine Weather* !

* In *Marriage*.

† *Virtue*.

‡ *An Eunuch*.

§ *Made of Iron*, to cripple the *Feet* of *female Children* ; an *Expedient* used since
 the *Chinese Women* rais'd a *Rebellion* to take the *Government* into their own *Hands* ;
 who failed, though they had nearly carried their *Plot*.

¶ In *Spain*, *Turkey*, &c.

¶ This is stipulated in the *Marriage Articles*, to prevent farther *Amours*. When
 the *Cicisbeo* comes the *Husband* must retire.

** Here,

Men put a *Padlock* on the *Mind*,
 Who are to *Women* very kind,
 And to their *Failings* are quite blind !
 Calathes pretty *Faces* bids,
 To avoid the *Sin* of being *spy'd*,
 And keep the *Skin* as white as *Snow*,
 That *Roses* there may never grow ;
 With *Head-dress* big, that may affright !
 That *Men* may never come in *Sight* ;
 On big *Heels* prop'd — like *Ghosts* upright !

ANSWERS to the REBUSES in last Year's PALLADIUM.

I. BRIDGEWATER.	V. THORN.	IX. ELGIN.
II. MOOR.	VI. COBHAM.	X. A SWAN.
III. HATCH.	VII. A-CUCKOLD.	XI. A GNAT.
IV. WATCHET.	VIII. HATFIELD.	XII. HUTTON.

A general Answer to the REBUSES by Mr. Isaac Gunley, of Countessbory.

LOVELY Spring again is seen,
 With her sweet enchanting Mien ;

Flowers arise to deck the Ground,
And to spread their Sweets around.
Hark ! the Linnet from the *Thorn*

5.

Gladly does salute the Morn.
*Cuckows,** that were silent long,

* Alluding to a Creature
whose Maker is Woman,

Entertain us with a Song ;

10.

Swans along the River sail,

11.

Gnats are driven by the Gale,

Now the Nymphs and jolly Swains

Saunter o'er the flow'ry Plains ;

Moor and *Hatfield*, with their Charms,

2. 8.

Draw the Swains around in Swarms ;

Hutton too Admirers gains,

12.

And she fills their Hearts with Pains,

Damon for young *Phillis* sighs,

Who his fond Request denies ;

Yes, young Damon now does prove

All the killing Pangs of Love.

Lovely *Phillis*, why so coy ?

Smile, and give our Damon Joy.

To your faithful Swain be kind,

Such another you'll ne'er find,

Should you search *Bridge-water* through,

1.

Watchet, *Hatch*, and *Cobham*, too.

4. 3. 6.

Come, my *Delia*, come away

To the Fields and Meadows gay ;

Hand in Hand come let us move,

Fill'd with Joy, and fill'd with Love.

Let the Miser hug his Pelf,

Cheat the World, and starve himself ;

Yet he does his Fate lament,

Never tasting true Content.

What is all the Pomp of Kings ?

Ev'ry Day it Trouble brings ;

While we taste of Joys sublime,

Joys as lasting as our Time.

VII. *Rebus* answered by Mr. W. Jon.

IF the *Longitude-Spright* a *Cuckow* must be,
The feminine Bird is as modest as he.

X, and XI. *Rebus* answered by Mr. Stuckfield, of Stepney, ACROSTIC.

M-ay ev'ry Charm await the Fair ;

I-n all the Joys of Life a Share ;

S-o that she may the *Swan* outdo,

10.

S-often, milder, beautifuller, too !

H-y-men, with all his tender Train,

I-nstrust her Heart, nor give her Pain !

L-et her, unlike the *Gnats* that teize,

11.

L-earn the best Art, — the Art to please.

All the *Rebus* answered by the Rev. Thomas Vaughan, M. A.

Cambridge, Moor, Cobham, Watchet, and *Hatch*, there's no Doubt,
To the five first *Rebus* Answers make out ;

A *Cuckold*

A Cuckold and Hatfield, Hutton, Elgin, and Gaas,

The other five Rebuses tell very pat.

A Swan, and a Thorn, two more plainly tell.

If these are the Answers — I've done very well.

Mr. John Wilson, of Aldborough, answered all but the 12th Rebus; Mr. Richard Dalton, all but 1, 2, 3, 9, 10; Mr. James Potts, all but 1, 12; Messrs Wadsworth and Wilson, all but 2, 9, 12; Mr. William Wells, all but the 3; Mr. Hartley, all but 1, 9, 11, 12; Mr. G. Lacey, all but 6 and 12; Mr. Richard Drake, all but 4, 10, 12; a Northumbrian, all but 11, 12; Mr. W. Hurn, of Watton, all but 2 and 12. Mr. Stuckfield answered the 2 and 3.

Mr. G. Lacey, of Bridport, takes Notice of his being upbraided for his Rebus on Dartmouth, as if he had taken it wholly from Others made before; whereas the same Subjects in the Lady's Diary have been often repeated for *Enigmas* — and Questions are liable to the same Sentiments: But if the same Things are proposed in a different Manner and Dress, there may be still Improvement in Diction and Sentiment, and therefore not blameable.

Mr. G. Perrot answered 1, 2, 5, 6, 7, 8, 10; Mr. W. Marsden, all but 1, 3, 7, 9; Mr. Joseph Hartley, all but 3, 9; Mr. Joseph Sherwin, 7, 8, 10; Mr. James Muscroft, 5, 7, 8, 12; Mr. W. Penn, 6, 7, 8, 10; Mr. Alexander Rowe most of the Rebuses; Mr. Rob. Arnold, junior, of Brinsworth, 5, 7, 8, 12.

N. B. We should be glad to know an ingenious Correspondent's Reason (at Pool, Carmarthen) for saying, "The very useful Practical Arithmetician surprisingly circulates through this Neighbourhood, [though never yet published,] of which none are so glad as myself, nor none so willing to encourage real Science."

It will begin to circulate at the Publication of this *Palladium*.

ANSWERS to the PARADOXES in last Year's PALLADIUM.

I. PARADOX answered by the Proposer, Mr. W. Wilson, of Norwich.

THIS Correspondent finds the Weight of a Cone, on its Base, and when inverted, by the Arithmetic of Fluxions, (putting r for the Earth's Radius, a = the Cone's Altitude, b = Diam. Base, and x = Part of the Axis, the flowing Quantity,) he comes to these Conclusions, (after making the flowing Quantity

and other Quantities vanish :) As $\frac{3r^2 - 2ra - a^2}{r + a} - 3r - 3a + \frac{a^2}{r} -$

$\frac{1}{2r + 2a} \times \text{Hyp. Log. } \frac{r + a}{r}$ (the Weight on the Base) : $\frac{3r^2}{r + a} - 3r + a - 2a$

$\times \text{Hyp. Log. } \frac{r + a}{r}$ (Weight inverted) :: 100 : 99 Tons, (per Quæst.) Mul-

tiplying *Extremes* and *Means*, an Equation is had, from whence a , the Cone's Height, in Respect of the Earth's Radius, may be found by *Trial and Error*. — But this Answer is rather more *speculative* than practical.

Mr. Hartley answered it thus. Put a and b = 100 and 99 Tons, r = the Earth's Radius in Miles, and x = the Earth's Radius with the Cone's Height in Miles. Then, since any Body, placed above the Earth's Surface, is in the reciprocal duplicate Ratio of the said Distance, we have, $x^2 : r^2 :: a : b$.

Extremes and Means reduced, $x = \frac{\sqrt{a \cdot r^2}}{b}$.

Mr. Alexander Rowe's Answer. — The Earth's Attraction and Air's Pressure on the Cone (when in Contact with its Surface) make the Weight greater by a Ton, or more, when the Cone stands on its Base than on its Vertex. II.

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II. PARADOX answered by Mr. Richard Dalton, of Pool, Carmarthen.

HANNAH.

Mr. James Potts also answered it; as did Mr. John Wilson; Mr. Joseph Hunt, who says, when two Letters are taken from the Word, it yet will retain the same Sound. Miss Hannah M—y, of Newport, answered it; but observes, it will admit of only altering to *Hanab*, (cutting off one Letter, *n*.) but not to *Anna*, (cutting off two Letters,) for *Hana* will only read forward, when *n* and *b* are cut off. Mr. W. Wells answered it; as did Mr. Hartley, Mr. Richard Drake, Mr. W. Hurn of Watton, Mr. St. Hill of Watworth, Mr. Richard Dalton, Mr. W. Hayer, Mr. James Hartley, Mr. James Muscroft, and Mr. Penn.

III. PARADOX answered by Mr. R. C. the Proposer.

IN the Latitude of the Middle of the Isle of Wight, the Distance round the Earth, measuring directly East or West, is about 15970 Miles; and, as the Earth runs round in $23^h 56^m$, the Isle of Wight rides from East to West, at the Rate of 660 Miles an Hour, continually. And, if a Man rides on Horseback, or in any Carriage, 10 Miles an Hour due East, he will ride in all 670 Miles an Hour.

Mr. W. Wells observes that there are many such Riders in the same Latitude.

Mr. Richard Drake answered it something like the Proposer's Answer.

Mr. Joseph Hartley observes that the Inhabitants of the Isle of Wight, by the diurnal Motion of the Earth, travel at the above Rate, or faster.

Mr. W. Penn observes that

Mr. R. C. in the Isle of Wight,

*If the Earth moves 1000 an

Rode 670 Miles* an Hour by Day and Night.

Hour at the Equator.

Mr. Alexander Rowe observes, that the Rider's Pegasus was the Earth, that carried him at that Rate by its Rotation.

IV. PARADOX answered by Mr. W. Jon.

MARK the Middle of the 4 Sides of the Square (or Parallelogram) with Points, and draw Lines from one Point to another, to form an inscribed Square (or Parallelogram); and the inscribed Square (or Parallelogram) will be exactly of the same Height and Width (from Corner to Corner) with the first Square (or Parallelogram), measuring each Side and End; and the Area of the inscribed Square (or Parallelogram) will be exactly Half the Area of the greater; as may be geometrically proved by Construction.

Mr. St. Hill, of Watworth, answered it in the same Manner, as did Mr. Alexander Rowe. — Mr. George W—e, of Newport, answered it by stopping up Half the Window's Space at the Middle, but does not say how; as did Mr. Drake. Mr. W. Wells answered it.

Mr. William Pen, of Chalfont, observes,

From one Square Window's Space another frame;

*To the Middle

Cut the four Corners* off—the Height and Breadth's the same. of each Side.

ANSWERS to the QUESTIONS in last Year's PALLADIUM.

I. QUESTION 471, answered by the Palladium-Author, jun.

THIS is one of that Sort of Questions, called unlimited; and therefore admits of more than one Answer. The Prime-Money, $27\text{ }s. 3\text{ }s. 6d.}\frac{1}{2} = 264171$ Farthings $= 509$ Seamen $\times 519$ Farthings each $= 519$ Seamen $\times 509$ F. each $= 3$ Seamen $\times 88057$ F. each $= 88057$ Seamen $\times 3$ F. each $= 173$ Seamen $\times 1527$ F. each $= 1527$ Seamen $\times 173$ F. each; being 6 Answers. W.W.R.

N. B. This Question can be only answered by Trial, or Division of the given Number, 264171 Farthings, by all the prime, and then compound, Numbers: *Literal Arithmetic* affording no Advantage in finding a Solution. Mr.

Mr. Richard Dalton, of Pool, Carmarthen; Mr. Wm Penn, of Chalfont St. Peter's, Bucks; Mr. Wm Hayes, of Frodsham, Cheshire; were the only Correspondents who sent us the complete Answers to the above Question. But Mr. W. Shaw, of Newchapel, Staffordshire, gave a single Answer to the same; as did Cleonicus, of Kendal; Mr. Fininly, Master of a School, at Thorney, near Peterborough; his Pupils, Mr. Thomas Lee and Mr. George Sisson; Mr. Stephen Hartley, of Sowerby-Bridge; Mr. John Fatherley, of Washington, Durham; Mr. Alexander Rowe, of Reginnis, Cornwall; Mr. James Potts, of Bedlington; Mr. George Hicks, of Reedness; Mr. John Sandys, of Tbedleston, near Derby; Mr. Joseph Hartley, of Leewes, Sussex; Mr. Thomas Robinson, of Biddick; Mr. Wm Hardy, of Cottingham-School, near Hull; Mr. L. Harland, of Kingston upon Hull; Mr. James Muscroft, of Rotterham; Mr. Michael Taylor, of Marley-bill, near Gibside; Mr. John Harrison, of Helsby, Cheshire; Mr. Wm Wells, of Crowle, Lincolnshire; Mr. Draper, of Surry; Mr. George Perrot, of Heisle; J. N. of Stanton; and Gemini, of Morpeth; but gave no more than a single Answer each.

II. QUESTION 472, answered by the Palladium-Author, junior.

CASE I.

Bags	Contain	Number	Value.
1	Guineas	1097	115 <i>l.</i> 17 <i>s.</i> 0 <i>d.</i>
2	Half-Guineas	907	476 3 6
3	Quarter-Guineas	743	195 0 9
4	Half-Crowns	701	87 12 6.
5	Shillings	569	28 9 0
6	Six-Pences	401	10 0 6

Sum 4418 1949 3 3. The Estate cost.

According to Pieces in each Bag, the }
greater Value of a Piece having the } Also $1097 \times 907 \times 743 \times 701 \times 569$
greater Number. } $\times 401 = 118,243,529,689,909,193,$
(18 Figures.) One Way of Answer.

CASE II.

Bags	Contain	Number	Value.
1	Guineas	401	421 <i>l.</i> 1 <i>s.</i> 0 <i>d.</i>
2	Half-Guineas	569	298 14 6
3	Quarter-Guineas	701	184 0 3
4	Half-Crowns	743	92 27 6
5	Shillings	907	45 7 0
6	Six-Pences	1097	27 8 6

Sum 4418 1069 8 9 The Estate cost.

According to Pieces in each Bag, the }
greater Value of a Piece having the } Otherwise.
less Number of Pieces in that Bag. } This last Case is the true Answer.

Mr. Michael Taylor, of Marley-bill, may now see the young Lady's Meaning, that she was consistent, who proposed this Question.

The ingenious Mr. Hayes, of Frodsham, answered this Question as follows.

He supposes the Number of Pieces in each Bag (exclusive of the Guineas) to be equal; as the continual Product of those Numbers will then be the greatest. He finds that the Number of Guineas must exceed 318. And then, by trying the prime Numbers (*i. e.* those divisible by 1 only) above 318, he finds the Number of Guineas to be 401. Whence, by proceeding in the same Manner for the other Numbers, he finds the Number of Half-Guineas = 569; Quarter-Guineas = 701; Half-Crowns = 743; Shillings, 907; Six-pences, 1097; which Numbers exactly answer the Conditions of the Question. Whence he finds the Value of the Estate 1069*l.* 8*s.* 9*d.* as above. W. W. R.

Not

Not one of our *Correspondents*, besides Mr. *Hayes*, has so much as attempted to answer the foregoing *Question*; but some Gentlemen (otherwise very capable) affirm it to be *defective*, and therefore avoid taking it in Hand.

III. QUESTION 473, answered by Mr. Richard Dalton, of Pool, Carmarthen.

GENERAL RULE. Let $a=12$, and $b=10$; then $\frac{ab}{a-1} = 10 \text{ h. } 54 \text{ m.}$

32 Sec. 8-11ths = Time required.

Mr. *William Hedley*, of *Durham*, answers it thus. — As 11 to 12 so 10 to 20 h. 54 m. 32 s. 8-11ths; serving for a *General Rule*.

Mr. *James Lamb*, Schoolmaster, at *Aldbrough*, near *Hull*, answered it in the same concise and elegant Manner; as did Mr. *Fatherley*; Messrs *Wadforth* and *Wilson*, Pupils to Mr. *Lamb*; Mr. *Potts*; Mr. *Sandys*, (as a general Rule, he bids to multiply the Number of Minutes, standing against the Hour, by 12, and then to divide the Product by 11 for the Moment of Conjunction;) Mr. *James Egginton*, at *Burton upon Trent*; Mr. *Marsden*; Mr. *Joseph Hartley*; Mr. *Perrot*; Mr. *Robinson*, of *Biddick*; Mr. *Wm Hardy*, of *Cottingham*; Mr. *Harland*; Mr. *Hayes*; Mr. *Harrison*; Mr. *John Shadgett*, of *Ross*; Mr. *Gumley*; Mr. *Muscroft*; Mr. *Pen*; Mr. *Robert Arnold*, junior; Mr. *Joseph Sberwin*, junior, at *Alkhampton*, near *Derby*; Mr. *Wm Wilson*, of *Lincoln*; Mr. *Draper*, of *Surry*; Mr. *Stephen Hartley*; Mr. *Fininley*, Master, and Mr. *Tee* and Mr. *Sisson*, his Pupils, at *Thorway*; Mr. *Ward*, Collector, at *Holdbreach-Bar*; Mr. *James Nicholson*, of *Staunton*; *Cleonicus*, at *Kendal*; Mr. *William Shaw*; Mr. *Wm Wells*; Mr. *Alexander Rowe*; Mr. *George Hicks*; Mr. *Sam. Hill*, of *Walworth*, *Surry*; Mr. *Michael Taylor*; Miss *Sally Hill*; and Mr. *Richard Drake*.

IV. QUESTION 474, answered by Mr. John Shadgett, of Ross, Herefordshire.

PUT x = Time required. The Quantities voided by the several Cocks in that Time will be $\frac{x}{6}$, $\frac{x}{8}$, $\frac{x}{10}$, $\frac{x}{9}$, $\frac{x}{11}$, and $\frac{x}{13}$, respectively. Whence, (by the

Question,) $\frac{1}{\frac{1}{6} + \frac{1}{8} + \frac{1}{10} - \frac{1}{9} - \frac{1}{11} - \frac{1}{13}} \times x = 1$. By Division, $x =$
 $\frac{1}{\frac{1}{6} + \frac{1}{8} + \frac{1}{10} - \frac{1}{9} - \frac{1}{11} - \frac{1}{13}} = 3.87127 \text{ Hours} = 3 \text{ h. } 52 \text{ m. } 16 \text{ s. } 34 \text{ th. \&c.}$

Mr. *Wm Hayes*, of *Frodsham*, solved it by a Method similar to that above, and in the same correct Numbers; as did *Gemini*, of *Morpeth*, *Cheeshire*.

Mr. *William Hardy*, of *Cottingham School*, solves it thus.

Filling Cocks. $\left\{ \begin{array}{l} 1^{\text{st}} \text{ Cock fills } \frac{1}{6} \\ 2^{\text{d}} \text{ ————— } \frac{1}{8} \\ 3^{\text{d}} \text{ ————— } \frac{1}{10} \end{array} \right\}$ of the Cistern in 1 Hour.

Running all together, $\frac{1}{6} + \frac{1}{8} + \frac{1}{10} = \frac{47}{120}$ of the Cistern will fill in 1 Hour.

Emptying Cocks. $\left\{ \begin{array}{l} 1^{\text{st}} \text{ Cock empties } \frac{1}{9} \\ 2^{\text{d}} \text{ ————— } \frac{1}{11} \\ 3^{\text{d}} \text{ ————— } \frac{1}{13} \end{array} \right\}$ of the Cistern in 1 Hour.

Running all together, $\frac{1}{9} + \frac{1}{11} + \frac{1}{13} = \frac{359}{1287}$ of the Cistern will empty in 1^h.

Hence, $\frac{47}{120}$ filled — $\frac{359}{1287}$ emptied = $\frac{17409}{154440}$ filled, in 1 Hour, all the

Fillers and Emptiers running together.

Therefore,

Therefore, As $\frac{17400}{154440}$ Parts : 1 h. :: 2 Wh. : 8 h. 52 m. 16 s. $\frac{18}{583}$,

the Time required to fill the *whole Cistern*, or *Reservoir*, by all the *filling* and *emptying* Cocks running together.

Some of our *otherwise-capable* Correspondents, by some *strange Misconception* of this *Question*, or *Mistake* in their Operations, found the Time, 1 h. 29 m.

28 s. $\frac{2608}{103569}$, instead of the *true Time*, as above.

Mr. Wm Pen gave 8 h. $\frac{5056}{5803}$ by a *proper Deduction*; first supposing the *Reservoir* to hold 120 Gallons; when the first Cock will fill 20 G. the second, 15 G. the third, 12 G. $= \frac{1}{6} + \frac{1}{8} + \frac{1}{10}$ in 1 Hour; the first Cock will empty $13\frac{1}{3}$ G. the second, $10\frac{10}{11}$ G. the third, $9\frac{3}{13}$ G. $= 33\frac{203}{429}$ Gallons $= \frac{1}{9} + \frac{1}{11} + \frac{1}{13}$ in 1 Hour. Hence, 47 G. $- 33\frac{203}{429}$ G. $= 13\frac{326}{429}$ G. : filled in 1 Hour :: 120 G. : $\frac{120}{13\frac{326}{429}} = \frac{51480}{5803}$ Hours = as before.

Observation. If 51480 be taken for the Gallons the *Reservoir* contains, (the least Number that 6, 8, 10, 9, 11, 13, will divide,) then the 1st Cock will fill 8580 G. 2d, 6435 G. 3d, 5148 G. $= 20163$ Gal. } in one 1st ——— empty 5720 G. 2d, 4680 G. 3d, 3960 G. $= 14360$ Gal. } Hour.

All running together fill 5803 Gallons : in 1

Hour :: 51480 G. : $\frac{51480}{5803}$ Hour = as before. PALLADIUM-AUTHOR.

Mr. Lamb answered the same truly; as did Mr. Wm Shaw; Mr. John Wilson, of Aldbrough School. Mr. Draper answered it; Mr. James Potts; Mr. Wm Wells; Mr. George Perrot; Mr. J. S. Watchorn; Mr. Samuel Hill, of Watworth; Mr. Wm Wilson, of Lincoln; Mr. Michael Taylor; and also Miss Sally Hill; answered it in the same Manner.

What is amazing, after some Correspondents have missed the *true Time*, in giving Answer, and so many have given *true Answers*, that One of our *ingenious* Correspondents (among the Mines, who is willing to defend his other *Mistakes*, detected by one of our very worthy and very capable Correspondents) affirms that this *Question* is *impossible*, with the present *Data*, because (he says) that the *evacuating* Cocks together discharge more (in the same Time) than the *supplying* Cocks fill. Who computes that the Time of *filling* the *Reservoir* by the 3 *supplying* Cocks

$= \frac{6 \times 8 \times 10}{6 \times 8 + 6 \times 10 + 8 \times 10} = 2^h.55319, \&c.$ and the Time of

emptying, or of the *Reservoir's* running out, $= \frac{9 \times 11 \times 13}{9 \times 11 + 9 \times 13 + 11 \times 13} =$

$3^h.58495, \&c.$ supposing the *Reservoir* full, and the *supplying* Cocks stopped, and *evacuating* Cocks open. Whence he infers the *Impossibility* of ever filling the

the *Reservoir* by the supplying and emptying Cocks as given ; but whether from *true Principles* must be submitted : On which Account (without mentioning any Name) we have set down the Deductions, as sent us by himself, from his own *Principles*, for the *Curious* to examine, as we pretend not to understand them, though we are willing to find Truth. If he is *wrong*, it is hoped that our Correspondents, in general, will be the more *cautious* of making erroneous Assertions. He concludes with a *curious Remark*, that, the Cistern or Reservoir being full, and the supplying and evacuating Cocks discharging equal Quantities in the same Time (*precisely*,) the *Reservoir* would *never* be empty, but would remain full for ever, or for Time *ad Infinitum*, viz. $Q + a - a = Q$, for ever.

V. QUESTION 475, answered by Mr. Richard Dalton, of Pool, Carmarthen. Put $x =$ the Thickness of the Ring, $a = 2.8$, $c = .7854$, $b = 3.1416$, $d = 10.3592$, $=$ Ounces Troy in a cubic Inch of Gold. Therefore, $a - x =$

Circumference ; and, by Mr. Emerson's Mensuration, P. 113, $\frac{a - x - bx}{b} \times$

$cx^2 \times b =$ Solidity ; whence, $\frac{a - x - bx}{b} \times ax^2 \times b \times d = \frac{12.15.1d. \frac{1}{2}}{4l}$: Reduced

and solved, $x = 0.1183$ nearly, the Thickness of the Ring ; and $a - x = 2.6817$ Inches, the Thickness of the Ring added to the Circumference. W. W. R.

Mr. Alexander Rowe answers it thus. — As $4l : 1 Oz. :: 12.15.1d. \frac{1}{2} : .2638 Oz.$ By Tables, P. 121, *Ward's young Mathematician's Guide*, the Weight of a cubic Inch of fine Gold $= 10.359273$ Ounces Troy. Whence, $.2638 Oz. \div 10.359273 = .0254653$ Parts of an Inch $=$ Ring's Solidity.

Put $a = 2.8$ Inches, $b = .0254653$, $c = 3.1416$, and $x =$ Thickness of the Ring. By the Question, $a - x =$ the Ring's outward Circumference,

$\frac{a - x}{c} =$ its whole Diameter, $\frac{a - x}{c} - ax =$ the inner Diameter, and $a - x -$

$ax =$ the outer Periphery, and $a - x - cx =$ the mean Circumference :

Whence, $\frac{cx^2}{4} \times \frac{a - x - cx}{a - x - cx} = b$. — Reduced, we have $x^3 - .6760672x^2 =$

$-.0078287$; solved, $x = .11845$, the Thickness of the Ring ; and the other Dimensions follow ; $a - x = 2.68155$ Inches, the Thickness of the Ring added

to the Circumference ; $\frac{a - x}{c} = .8535$ &c. the Ring's whole Diameter ; $\frac{a - x}{c}$

$- ax = .6166$, the Ring's mean Circumference. W. W. R.

The ingenious Mr. John Harrison, of Hestby, finds (by proper Substitution and Deduction) the Thickness of the Ring $.1183\frac{1}{2}$, whence the Rest of the Dimensions follow. Mr. James Lamb, by a Process of the 3d Power, has found the Thickness of the Ring to be $.1185$, (nearly agreeing with Mr. Rowe's Number,) thence the outward Circumference $= 2.6815$, and inner Diameter $= .6165459$. Mr. Joseph Hartley, of Lewes, from a correct Process and Solution of the final Equations, finds the Thickness of the Ring $= .1185$, (*like a Workman* !) thence the outward Circumference 2.6815 Inches, confirming the Truth of the foregoing Numbers. The expert Mr. Wm Hoyer finds $.1185$ &c. for the Ring's Thickness ; but most of our other Correspondents either wrought not the numeral Answer out from the final Equation, (which we look upon as doing Nothing, or Time thrown away, and such literal Solutions not worth Notice unconfirmed by Numbers,) or else gave Numbers so wide of Truth, that they would prove their Want of practical arithmetical Talents to produce them.

Litton

Literal Solutions only (we would have it henceforward observed) are not worth our Notice, as being unfit for Publication. The Numbers, agreeing with and confirming one another, stamp the Worth on every Solution by *literal Arithmetic* and only Theory reduced to *Practice*, the *numerical Proofs*, make Solutions contain real Worth. — *Gemini*, of *Morpeth*, by a curious Process and final Equation of the 3d Power, finds the Ring's Dimensions nearly as before.

VI. QUESTION 476, answered by Mr. John Shadgett, of Ross, Herefordshire.

SUBTRACT the 3d given Eq. from the 2d, and the *Remainder* will be $w^2 - w + x - x^2 = 20$, or $w^2 - w = x^2 - x + 20$. Now it is easy to see that w and x must be two such Numbers, as that, being taken from their respective Squares, the Differences of these Differences will be 20; and it appears, by *Inspection* only, that the Numbers 5 and 1 have this Property. Substitute, therefore, 1 instead of x , and 5 for w , in the 1st, 3d, 4th, and 5th, given Equations, and they will be reduced to $w^2 + y + x = 100$, $w + y + x = 44$, $w + y^2 + x = 316$, and $w + y + x^2 = 386$; the 2d of which subtract from the other three, severally, and we shall have $w^2 - w = 56$, $y^2 - y = 272$, and $x^2 - x = 342$; whence, by completing the Square of each, $w = 8$, $y = 17$, and $x = 19$: From all which it appears that the *Lady* has lost her HEART.

The ingenious Mr. Stephen Hartley, of *Sowerby-Bridge*, has made the same Observations, and gives the Answer in the same Manner.

Mr. Wm Hayes proceeds as follows. — Subtract the 3d Equation from the 2d, and $w^2 + x - x^2 - w = 20$. It is evident, from the 1st Equation, that x cannot exceed 3; therefore, in this Equation, x is found = 1, and $w = 5$; whence $v = 8$, $y = 7$, and $z = 19$; and the required Word is HEART.

Mr. Joseph Hartley, of *Lewes*, answered this Question from the same Principles, by a complex final Equation.

Mr. Richard Dalton, of *Pool, Carmarthen*, proceeds thus: — The third given Equation being taken from the second, and the Square completed, $w =$

$\sqrt{\frac{1}{4} + 20 + x^2 - x} + \frac{1}{2}$, where it is plain that w is greater than 4; but $x =$

$\sqrt{\frac{1}{4} + 20 - w^2 + w} + \frac{1}{2}$, which makes it also evident that w is less than 6, which consequently will be found = 5, and $x = 1$; therefore, by simple Quadratics, $y = 17$, $z = 19$, and $v = 8$; answering to HEART, which the poor Lady lost. — *Gemini*, of *Morpeth*, answered it in the same elegant Manner.

Mr. Gumley subtracts the 2d from the 1st Equation, and $w^2 - w^2 + w - v = 36$; whence, by a few Trials, $v = 8$, and $w = 5$; from the 2d Equation, $w^2 + x^2 + x - w = 20$; or $20 - x^2 + x = 20$, (by Substitution of 5 for w .) Here $x = 1$. From the 4th take the 3d Equation, and $x^2 - y^2 + y - x = 70$. Hence, by proceeding as above, $y = 17$, and $z = 19$.

Therefore the Lady, to her Cost,

Her HEART, or her Affections, lost.

Mr. Draper answered this Question by the same Principles; but his other Answers are without Numbers wrought out, and therefore of no Use.

Mr. William Wells observes, in Answer to this Question,

Th' Equations solv'd, the Numbers tell 28, 3, 17, 19.

The Lady's lost her HEART;

Which having found, I'd have her well

To guard that tender Part.

Mr. Fininley, by a complicated final Equation, had from the several given Equations, finds the Answer to be HEART; as does Mr. Nicholson, Mr. Potts, Mr. Hardy, Mr. Rowe, Mr. George Perrot, and Mr. Joseph James of *Stoke-Bishop*.

Mr. John Harrison, Mr. Thomas Robinson, Mr. Pen, and Mr. Michael Taylor answered it.

VII. QUESTION 477, answered by Mr. Jos. James, of Stoke-Bishop, near Bristol.

THE Value of x , in the first Equation, is $41 - yz$; and, in the second, $\frac{89 - y}{x} = 41 - yz$; from whence, $y = \frac{41x - 89}{x^2 - 1}$; since y and x must both be whole positive Numbers less than 25, by a few Trials y is found $= 5$, $x = 4$, and $z = 21$; so that I find *Sophy* consented to WED, "To ease her Horner's Care."

The same answered by Mr. James Lamb, at Aldbrough, near Hull.

$$\text{GIVEN } \left\{ \begin{array}{l} 1 \quad x + yz = 41 = a \\ 2 \quad y + xz = 89 = b \\ 3 \quad x + xy = 108 = c \end{array} \right\} \begin{array}{l} x = ? \\ y = ? \\ z = ? \end{array}$$

$$1, - yz \quad 4 \quad x = a - yz.$$

$$2, - y \div x \quad 5 \quad x = \frac{b - y}{x}.$$

$$3, - x \div y \quad 6 \quad x = \frac{c - x}{y}.$$

$$4 \text{ and } 5 \quad 7 \quad \frac{b - y}{x} = a - yz.$$

$$7 \times 2 \quad 8 \quad b - y = ax - yxz.$$

$$8 + yxz = b \quad 9 \quad yxz - y = ax - b.$$

$$9 \div x - 1 \quad 10 \quad y = \frac{ax - b}{x^2 - 1}.$$

$$\text{And 6th Equat.} \quad 11 \quad a - \frac{ax^2 - bx}{x^2 - 1} = \frac{cx^2 - c - x^3 + x}{ax - b}.$$

Reduced & solved $12 \quad x = 4$; whence $y = 5$, and $z = 21$; answering to the 3 Letters in the Alphabet, composing the Word, WED. W.W.R.

Mr. Potts answered it by an Equation similar to the above. Mr. G. Hicks gives a short Answer. Cleonicus, of Kendal, solved it by an Equation of the 5th Power. Mr. James Nicholson, of Stanton, solved it; Mr. Dalton; Mr. Wm Hedley, of Durham, by an Equation similar to Mr. Lamb's above; Mr. Wm Finerley, by a complicated final Equation; Mr. Wm Wells, by a difficult Equation; Mr. Robert Arnold, junior, by an Equation; Mr. Muscroft, by an Equation; Mr. Joseph Hartley, shortly, by an Equation; and Mr. John Wilson, of Aldbrough School, Mr. Shaw observes, in his Answer,

*Sophy, who gave Consent to WED,
With Honours crown'd her Lover's Head.*

Mr. Gumley, after answering this Question by an Equation, observes,
*Therefore, that all might be well said,
Sophy gave Horner Leave to WED.*

Mr. John Harrison answered it; as did Mr. Wm Hayes, Mr. Thomas Robinson, and Mr. Stephen Hartley, who observes,
*When Sophy did her Horner WED,
She planted Honours on his Head,*

Mr. *Pew* answered it; as did Mr. *Shadgett*, by an elegant Equation; Mr. *Fatherley*; Mr. *Sandys*; Mr. *Taylor*; and Miss *Sally Hill*.

Second VII. QUESTION 478, answered by Mr. Joseph James, of Stoke-Bishop,

GIVEN, $\frac{\sqrt{x^3} - \sqrt[3]{x^4}}{\sqrt[3]{x}} = x$; whence $x\sqrt{x} - \sqrt[3]{x} = x\sqrt{x}$; di-

viding by x , then $\sqrt{x} - \sqrt[3]{x} = \sqrt[3]{x}$. Hence, by Transposition, $\sqrt{x} = 2\sqrt[3]{x}$; for x put y^6 ; then $y^3 = 2y^2$, or $y=2$; whence $y^6 = x = 64$.
W. W. R.

Mr. *Harland* reduces the Notation to $x^{\frac{3}{2}} - x^{\frac{4}{3}} = x^{\frac{4}{3}}$, when (by Transposition) $x^{\frac{3}{2}} = 2x^{\frac{4}{3}}$, the same as (ordering the fractional Indices) $x^{\frac{9}{6}} = 2x^{\frac{8}{6}}$; (divide each Side by $x^{\frac{8}{6}}$) and $x^{\frac{1}{6}} = 2$; involve which Equation to the 6th Power, and $x = 64$, the Answer.

Mr. *Joseph Hunt*, junior, of *Winslow School*, answered it in Numbers only.

Mr. *Sandys* substitutes properly, at once, $y^6 = x$; then the Equation becomes

$$\frac{y^9 - y^8}{y^2} = y^6 \therefore y^7 - y^6 = y^6, \text{ or } y^7 = 2y^6; \text{ whence } y=2, \text{ and } y^6 = 64 = x,$$

as before; being the genuine Method of Solution, without going about the Wood.

Mr. *Fatherley* answered the same; as did Mr. *Hartley*, of *Sowerby-bridge*; Mr. *Robinson*; Mr. *Hayes*; Mr. *Harrison*, by the genuine Method; and Mr. *Gumley*, who says, very poetically,

Your Question, I own, was well form'd to perplex,

Yet I've found 64 is the Value of x .

Mr. *John Wilson* answered it shortly; as did Mr. *Dalton*, very concisely; Mr. *Joseph Hartley*, by a short Reduction, without Substitution; as likewise did Mr. *Staw*; and Mr. *Shadgett*, very elegantly. Mr. *Wm Wilson*, Mr. *Fininley*, Mr. *Hedley*, Mr. *Nicholson*, Mr. *Hill*, *Cleonicus*, Mr. *Hardy*, Mr. *Rowe*, Mr. *Lamb*, and Mr. *Perrot*, gave elegant and similar Answers. Also Mr. *Michael Taylor* and Miss *Sally Hill* answered it.

VIII. QUESTION 479, answered by Mr. Joseph James, of Stoke-Bishop.

PUT w , x , y , and z , respectively, for each Part of the 100 Guineas.

By Quest. 1 $w+x+y+z = 100 \text{ Guineas} = 100800 \text{ Farthings.}$

2 $\frac{w}{5} = 5y$ } In the 4th Equation, $w = x - 10$; this put in
3 $5y = w + 5$ } the 3d, $y = \frac{x-5}{5}$; which Value of y put in
4 $w+5 = x-5$ } the 2d Equation, we have $x = 5w + 25$; lastly, for w , y , and z , in the 1st Equation, write their respective Values, and by Farthings. l. s. d. q.

Reduction we get $x = 1405 = 14 \text{ l. } 11 \text{ s. } 9 \text{ d. } 1$

and, from above, $w = 1395 = 14 \text{ l. } 11 \text{ s. } 6 \text{ d. } 3$

$y = 2800 = 2 \text{ l. } 18 \text{ s. } 4 \text{ d. } 0$

$z = 7090 = 7 \text{ l. } 18 \text{ s. } 4 \text{ d. } 0$

Proof 100800 £. 105 s. 0 d. 0

Mr. John Sandys, of Thelthorpe, near Derby, answered it thus.

$$\left. \begin{array}{r} 2.77777 \\ 8.88888 \\ 18.88888 \\ 69.44444 \\ \hline \end{array} \right\} \text{Parts of a Guinea.}$$

Sum 99.99999

Mr. Harland answered it the same; so did Mr. J. S. Watchorne.

Mr. Nicholson, putting u , w , x , and y , for the 4 Parts, judiciously makes

$$\begin{aligned} u + w + x + y &= 100 = a. \\ u + 5 &= x \\ w - 5 &= x \\ 5x &= x \\ \frac{y}{5} &= x \end{aligned} \left\{ \begin{array}{l} \text{whence} \\ \left\{ \begin{array}{l} u + 10 = w \\ \frac{u + 5}{5} = x \\ \frac{u + 5}{5} \times 5 = y. \end{array} \right. \end{array} \right. \left\{ \begin{array}{l} \text{These Values put in the 1st Equation give} \\ 2u + 10 + \frac{u + 5}{5} + 5u + 25 = 100 = a. \\ \text{Whence, } 36u = 340, \text{ and } u = \frac{8}{9}. \end{array} \right.$$

Guineas.

$$\left. \begin{array}{l} u = 8 \frac{8}{9} \text{ths} \\ w = 18 \frac{8}{9} \text{ths} \\ x = 2 \frac{7}{9} \text{ths} \\ y = 69 \frac{4}{9} \text{ths} \end{array} \right\} \text{as be- fore.}$$

Mr. Richard Dalton, of Poole, gave general Theorems that reduce to the foregoing Values very correctly; but we have not seen any Method shorter than the above by Mr. Nicholson.

Sum 100 Guineas.

However, as Mr. Dalton's Theorems are ingenious, we give them, as follow.

Let a = the Parts to be added to, subtracted from, multiplied and divided by, k = the Number to be divided into those several Parts, represented by x , y ,

u , and v ; then $x = \frac{ka - a^2 - 2a^2 - a}{a^2 + 2a + 1}$, $y = \frac{ba + a^2 + 2a^2 + a}{a^2 + 2a + 1}$; $u =$

$\frac{ba^2}{a^2 + 2a + 1}$, and $v = \frac{b}{a^2 + 2a + 1}$, universally, in all Cases.

Mr. Hedley has determined the Numbers neatly thus. — Put $a = 105$. x , y , u , and v , the required Parts, then, by Quest. $x + y + u + v = a$; and $x + b =$

$y - b = bx = \frac{a}{b}$, (by putting $b = 5$.) therefore $x = bx - b$, $y = bx + b$; and u

$= b^2 x$. Consequently, $2bx + bx + x = a$; hence $x = \frac{a}{4b + b^2 + 1}$.

Here $u = 2 \frac{11}{12}$ ths and $x = 9 \frac{7}{12}$ ths } The Value in Pounds Sterling, and not in the very same Numbers in Guineas; but like Pounds and Parts Sterling; so } Mr. Ward has determined the first found Numbers in Farthings. } has Mr. Finley by an easy and correct Process.

Sum 105

Mr. Wm Wall answered it by a Process similar to Mr. Dalton's.

Gemin's short Answer is thus. — Put x , y , u , and v , for the Parts; then

$x + 5 = 5x = \frac{w}{5}$. Hence, $y = x + 10$, $x = \frac{x + 5}{5} = \frac{x}{5} + 1$, and $w = 5x$

$+ 25$; $\therefore 7 \frac{1}{5}x = 64$; hence $x = 8 \frac{8}{9}$ ths, $y = 18 \frac{8}{9}$ ths, $u = 2 \frac{7}{9}$ ths, and

$w = 69 \frac{4}{9}$ ths, Guineas and Parts.

Mr.

Mr. *Draper* has also determined the Parts of 100 Guineas truly. Mr. *Shad-gott* has determined the same Parts by a very curious and short Method, like Mr. *Nicholson's*; so has Mr. *Joseph Hartley*. Messrs *Wadford* and *Wilson* have given the Parts of 105*l.* Sterling for 100 Guineas. Mr. *Gumby* has given the Parts of 100 Guineas very *mathematically* and correctly. Mr. *Harrison* has given the Parts of 105*l.* Sterling; who, and some other Correspondents, complain that *Similar Questions* to this, and Others, in the *Palladium*, are in Books of eminent Authors; where they may see Questions *similar* to these in other Authors of Eminence; for *Similarity* is not the same, nor yet a Robbery of *Invention*; — Houses are built by the *Plans* of other Houses, and yet each House has its *Utility*, with Variations and Improvements. — Mr. *Hayer* solves this *Similar Question* to one in *Simpson's Algebra*, Prob. 35. P. 96, (many of whose Questions are *similar* to those in other Books, especially in *French* Authors, for *Simpson* was a Borrower from, and Improver of, several Authors,) and, pursuing the same Method that *Simpson* did, and that Others did before him, finds the Parts of 100 Guineas, as already determined by Others. Mr. *Robinson* determined the Parts of 105*l.* correctly. Mr. *Stephen Hartley* finds the Parts of 100 Guineas. Mr. *Pen* finds the Parts of 105*l.* Mr. *James Egginton*, late of *Litchfield*, but now of *Burton upon Trent*, in *Staffordshire*, finds the Parts of 100 Guineas; Mr. *Rowe* the same. Most falling into the Track of Others, without infringing on each Other's Merit. Mr. *Lamb* gives the Parts of 105*l.* according to Mr. *Emerson's Method*, in his *Algebra*, he says. Mr. *Wm Wilson* gave the Parts of 100 Guineas; Mr. *Hardy* the same; Mr. *Perrot* and Mr. *Potts* the same. Mr. *Shaw* found the Parts of 105*l.* as did Mr. *Thomas Elliot*, of *Myddem-bridge*, *Derbyshire*, and Mr. *George Hicks*. Mr. *Watchorn* by Parts of 100 Guineas; as did Mr. *Hill*, and Mr. *Drake*.

IX. QUESTION 480, answered by Mr. George Perrot, of Hesle.

PUT $x = 1$ French Crown, $y = 1$ Dollar, $z = 1$ Ducat: Then,

1	20x + 12y + 10z = 210	Shillings	} Per Quest.
2	24x + 16y + 12z = 260		
3	30x + 15y + 45z = 382		
1x6	4	120x + 72y + 60z = 1260	} 1x24 } ÷ 4 { 1x6.
2x5	5	120x + 80y + 60z = 1300	
5-4	6	8y = 40, th. $y = \frac{40}{8} = 5$.	} Put the Value of y, in the second and third Steps, and transpose them; then,
	7	24x + 12z = 180.	
	8	30x + 45z = 405.	
7x5	9	120x + 60z = 900	} 7x30 } ÷ 6 { 7x5.
8x4	10	120x + 180z = 1620	
10-9	11	120z = 720, th. $z = \frac{720}{120} = 6$.	} whence (by { 108 7th Step) x = { 24 = 4 <i>l.</i> 6 <i>s.</i>

Hence, 1 French Crown = 4*l.* 6*s.* 1 Dollar = 5*s.* and 1 Ducat = 6*s.* W.W.R.

Gemini, of *Morpeth*, answers this Question in the same Manner.

Notwithstanding this Kind of Question is in more eminent Authors than one, (who copy from each other's Plans without a Crime, as *Virgil* copied from *Hommer*, and *Milton* from both,) yet it was proposed in the *Palladium* for 1773, as a Pattern, to give a Solution by, in the most concise, easy, and practical Way. If any of our Correspondents think the Imitation of other Plans, or Patterns, of Questions, is a Fault, without any Regard to the Merit of an improved Solution, (such an one as the foregoing appears to be,) they should send us new Plans of their own, with the best Kind of Solutions, to rival all Improvements made before them.

Mr.

Mr. *Shadgate* solved this *Question* according to his usual *Brevity* and *Elegance*; but, the *Steps* not being so *conspicuous* in this *Case* as when set down in *Gradations* under each other, we have given the *practical Pattern* of Solution, for Example and Method, as the most intelligible to Pupils at School; this Sort of *Questions* being intended for the Improvement of Youth at School in *Literal Arithmetic*. A concise Treatise of which, under that Title, in familiar Terms and Examples, we expect to publish, for the Use of Schools and private Enquirers.

Mr. *Dalton* elegantly and shortly solved this *Question*; as did Mr. *John Wilson*, (a Youth of 14 in *Alabourgh School*.) by *Literal Arithmetic*. Our poetical Friend, Mr. *Cumley*, answered it by a Method truly mathematical. Mr. *Harrison* answered it truly by a short Method; as did Mr. *Stephen Harley*, Mr. *Pen*, Mr. *Hardy*, Mr. *Marsden*, Mr. *Elliot*, *Cleonicus*, Mr. *James Harley*, and Mr. *Lamb*, (by a Method like Mr. *Perrot's*.) Mr. *Rowe* shortly answered it; as did Mr. *Wells*, Mr. *Fininley*, Mr. *Wm Wilson*, Mr. *Harland*, Mr. *Hedley*, Mr. *Muscraft*, Mr. *Ward*, and Mr. *Hicks*. Mr. *Robinson* answered it: by a *short Process*, like Mr. *Perrot's* inserted, but with *Contractions*. Mr. *R. Arnold*, jun, answered it. Mr. *James*, by a judicious Reduction of the Equations given, (to $10x + 6y + 5z = 1260$ Pence, $6x + 4y + 3z = 780$ Pence, $2x + y + 3z = 384$ Pence,) finds very neatly and concisely, by a Comparison of them, their several Values, as found by Mr. *Perrot* and Others. Mr. *Hayes* reduces the 3 Equations to $10x + 6y + 5z = 105$ s. $6x + 4y + 3z = 65$ s. and $2x + y + 3z = 32$ s. Then 1 by 3, and 2 by 5, subtracting the greater from the less, $2y = 10$,

and $y = \frac{10}{2} = 5$ s. whence $x = 4$ s. 6d. and $z = 6$ s. Mr. *Potts* also gave a good Solution, as did Mr. *Fatherley*. Mr. *Nicholson* answered it; as did Mr. *Hill*, Mr. *Taylor*, Mr. *Drake*, and Miss *Hill*.

X. QUESTION 481, answered by Mr. G. Coughron, of Newcastle upon Tyne.

PUT $.5 = a$, $2 = x$, $500 = p$, and $1.04 = r$; then will ar^{x-1} , ar^{x-2} , ar^{x-3} , be the Amounts of the first, second, and third Receivings, respectively, at the End of x Years, from the Time that the Money was lent; and therefore, $a \times : r^{x-1} + cr^{x-2} + cr^{x-3} + cr^{x-4}$, to x Terms, will be the Amount of all the Receivings, at the End of x Years, $= a \times \frac{r^x - r^0}{r - 1}$; but pr^x will be the Amount of p , in the same Time, and,

consequently, (per *Quest.*) $pr^x = a \times \frac{r^x - r^0}{r - 1}$, or $mr^x = c^x = a$ Maximum, and to 0, where $m = 1 + p \times \frac{c - r}{a}$; now, by making the Fluxion

of $mr^x = c^x = 0$, we have $mr^x \times \text{Log. } r = c^x \times \text{Log. } c$, or $m \times \frac{\text{Log. } r}{\text{Log. } c}$

$\times r^x = nr^x = c^x$; and therefore, by taking Logs. $\text{Log. } n + x \times \text{Log. } r = x \times \text{Log. } c$; from whence $x = \frac{\text{Log. } n}{\text{Log. } c - \text{Log. } r} = 2.604$, &c. which would be the

Time when the Debt was greatest, were a proportional Part of the Receivings received

ceived every *Moment*, as it became due; but, as this is not the *Case*, and it is only received *yearly*, it is evident that the *Debt* will be greater (in the *present Case*) at the End of the 3d Year, just before the *Sum* for that Year is received, than it will be at the above Time; and it is also evident, that the *Debt* must be greater at the End of that Year just before its correspondent *Sum* is received, when the said *Sum* first exceeds the *Interest* of the remaining *Debt*, after this *Receiving* for 1 Year; and therefore it is plain that, in the *present Case*, the *Debt* will be the *greatest* at the End of the 4th Year, just before the 40*l.* for

that Year is received. — Again, when $mx^x - c^x = 0$, we have $\text{Log. } m - x + \text{Log. } r = x \times \text{Log. } c$, and $x = \frac{\text{Log. } m}{\text{Log. } c - \text{Log. } r} = 6.99575$, &c. for the

Time when the *Principal* and *Interest* will be received; at the End of the 7th Year, very nearly. W. W. R.

Mr. Robinson answers one Part of the *Question* thus. — Let $x = \text{Years}$ when the *Principal* and *Interest* will be received; then, As 100 : 41 :: 1 :

.04; therefore, $500 \times 1.04]^x = \frac{5 \times 2^x - 5}{2 - 1}$; this Equation solved, by

the Method of *Trial and Error*, $x = 7.053$ Years; in which Time the *Principal* and *Interest* will be received. — He takes no Notice when the *Debt* will be the *greatest possible*, in which Mr. Coughron's Reasoning is distinguished.

Mr. Wm Fininley has determined the Time, by a *Series*, 6.994 Years, when the *Principal* and *Interest* will be paid.

Mr. Alexander Rowe, puts $p = 500$, $r = 1.04$. $x =$ the Time in which the *Debt* will be the *greatest*. By geometrical Progression, $\frac{5 \times 2^x - 5}{2 - 1} =$

$5 \times 2^x - 5 =$ Sum of the yearly Payments, and $pr^x =$ the Amount of the *Principal*, p , in the same Time. Whence, by *Quest.* $pr^x - 5 \times 2^x + 5 =$ a *Maximum*; which will be so when $x = 3$ Years, [Why so?] or at the End of the 3d Payment. Again, let x denote the Time (from the putting out) in which the *whole Debt* will be received, the *Rest* remaining the same as be-

fore; then will $5 \times 2^x - 5 = pr^x$; and therefore $5 \times 2^x - pr^x = 5$. Solved, by *Trial and Error*, $x = 7.0538$ Years. Q. E. F.

Mr. Hardy, the Proposer, answers it thus. — Put $p = 500$, $x =$ (the Amount of 1*l.* with its Interest for 1 Year) 1.04, $a = 5$ *l.* = 1st Payment, and $d = 2$, the Multiplier; and put $t =$ Time required. Then, the whole A-

mount of p , in t Time, will be pr^t . Now, if the 1st Payment, 5*l.* (a) had continued out at Interest to t Time, its Amount would evidently be represented

$a - r^{t-1}$; (a being due only at the End of the 1st Year;) so likewise, if the 2d Payment, 10*l.* or ad , had continued out to the End of the Time t ,

then its Amount would be represented by adr^{t-2} , &c. whence the Continua-

tion of the *Series* is manifest; viz. $ar^{t-1} + adr^{t-2} + ad^2r^{t-3} + ad^3r^{t-4}$

&c. to $t-1$ Terms; therefore the 1st Term $= d^{t-1} \times ar$. Which *Series* being Nothing but an arithmetical Progression, its Sum is easily found

$\frac{ard^t - ar^t}{d-r} = \text{Sum of all the Payments exclusive of the last. Hence}$

$$pr^t = \frac{ard^t - ar^t}{d-r}, \text{ or } \frac{dpr^t - prr^t - ar^t - ard^t}{d-r} = \text{a Maximum.}$$

If we put $dp - pr = a = f = 475$, $b = ar = 5.2$, and $c =$

$$\frac{1}{d-r} = 1.0416 \text{ \&c. Then, by Substitution, } cfr^t - cbd^t = \text{a Maximum.}$$

If $cf = c = 491.7916 \text{ \&c. and } cb = n = 5.416 \text{ \&c. we shall have, by Sub-}$

stitution, $cr^t - nd^t = \text{a Maximum. Let } d = \text{hyperb. Log. of } r = 0.03922062278 \text{ \&c. and } B = \text{hyperb. Log. of } d = 0.693147192653 \text{ \&c.}$

Then, $icdr^t - inBd^t = 0$. Therefore, $edr^t = nBd^t$. Put $\frac{ed}{nB} = G$

$$= 5.1373371; \text{ it follows that } t = \frac{\text{Log. } G}{\text{Log. } d - \text{Log. } r} = 2.491447875 = 2 \text{ y.}$$

6 m. 1 w. 3 d. 21 h. 17 m. 19 s. + \&c. when the Debt is the greatest.

$$\text{Again, } pr^t = \frac{ard^t - ar^t}{d-r}; \text{ if } m = pd - pr + a = 485, \text{ and } n = ar =$$

$$5.2; \text{ then } mr^t = nd^t; \text{ in Logs. } t = \frac{\text{Log. } m - \text{Log. } n}{\text{Log. } d - \text{Log. } r} = 6.935779 =$$

6 y. 12 m. 0 w. 4 d. 14 h. 57 m. 55 s. + \&c. when the whole Debt will be paid off, by Principal and Interest received. W. W. R.

*** Some of our Correspondents make no Work in answering this Question, while they shine in answering other Questions.

XI. QUESTION 482, answered by Mr. G. Coughron, of Newcastle upon Tyne.

PUT $a = 4$, $c = \frac{1}{100}$, $r = \text{the Amount of } 1\text{. in } 1 \text{ Year at the Rate of}$

Interest which the Parties agree to allow each Other, and x for the Years the Lady ought to live to satisfy the Conditions of the Question. Then will $aS \times$

$r-1$ be the Sum which the Lady receives yearly, and its Amount (Compound

Interest) $= aS \times r-1 \times \frac{r^x - 1}{r-1} = aS \times \frac{r^x - 1}{r-1} = \text{the}$

Value of the Sum she will have received at her Death; but Sr^x will be the

Sum that is due to her at that Time; whence, $Sr^x - aS \times \frac{r^x - 1}{r-1} =$

cS , per Quest. which, reduced, gives $r^x = \frac{a-c}{a-1}$; hence $x = \text{Log. } \frac{a-c}{a-1} \div$

$$\text{Log. } r = \frac{\text{Log. } a-c - \text{Log. } a-1}{\text{Log. } r} = 7.27115 \text{ \&c. Years, when } a = 4, \text{ and } c$$

$$= \frac{1}{100} \text{ as per Quest. and } r \text{ supposed } = 1.04 \text{ at the Rate of } 4 \text{ per Ct. per An.}$$

Scobellum, or Inference. — The Answer will be the same (the other Quantities remaining unaltered) let the Value of S be what it will; (because S is now; and not before, seen to be multiplied in each Term of the Equation, and dividing off.) And when c is greater than 1, inferred from the Equation, the Question is impossible; x then coming out, in that Case, negative. — Some similar Remarks may be made on the last Solution. — *Plaudite! Plaudite!*

Mr. Hardy's Answer, the Proposer. — Put a = the Money the Lady receives each Year, r = the Amount of 1*l.* with its Interest for 1 Year; then the several Years Payments will be represented by $a, ar, ar^2, ar^3, \&c.$ to t Years. And the Sum of this Progression will be $\frac{ar^t - a}{r - 1}$. — The Sum

S , at first put out, would amount in t Years to Sr^t . Let b = the Sum the Banker was to gain; then, $\frac{ar^t - a}{r - 1} + b = Sr^t$. In Logarithms, $t =$

$$\frac{\text{Log } b - br + a - \text{Log } a - Sr + S}{\text{Log } r}, \text{ universally. Or, put } d = b - br + a, \text{ and}$$

$$t = \frac{\text{Log } \frac{d}{a - Sr + S}}{\text{Log } r}, \text{ then } t = \frac{\text{Log } \frac{d}{a - Sr + S}}{\text{Log } r}, \text{ universally. — For an Example, let } S =$$

$$100, r = 1.05; \text{ then } a = 20, \text{ and } b = 1; d = 19.95, \text{ and } t = 15. \text{ Also } \frac{\text{Log } 19.95}{\text{Log } 1.05} = 5.845, \text{ or } 5 \text{ y. } 10 \text{ m. } 3 \text{ w. } 6 \text{ d. } 13 \text{ h. } 55 \text{ m. nearly.}$$

Now, suppose that the Banker had gained Nothing, then, $t = \frac{\text{Log } 1\frac{1}{2}}{\text{Log } 1.05} = 5.89631, \text{ or } 5 \text{ y. } 11 \text{ m. } 2 \text{ w. } 4 \text{ d. } 6 \text{ h. } 9 \text{ m. nearly.}$

If the Sum S had been put out at Simple Interest, and retained the same Conditions, then $r = .05$; and the Progression would have been $20 + 21 + 22 + 23, \&c.$ which, to t Times the Sum, makes $\frac{40t + t^2 - 2}{2}$; and the Amount of S

$$= S + Srt. \text{ — Hence, } \frac{40t + t^2 - 2}{2} = S + Srt + b; \text{ solved, } t = \sqrt{425}$$

$$- 85 = 5.61551849. \text{ When the Banker gained Nothing, } t = \sqrt{429} - 15 = 5.721969. \text{ W. W. R.}$$

One of our ingenious Correspondents, who makes the Years very different from the Years above, (*viz.* $16\frac{1}{2}$), queries whether his Solution agrees with the Proposer's Meaning; which the Words of the Question must determine, as they determined his Meaning to Mr. Coughron.

Mr. Robinson's Answer. — Let S = the Sum of Money put into the Banker's Hands, x = the Years the Lady is to live, *per Quest.* p = 100*l.* r = the Rate of Interest. As $p : r :: S : \frac{rS}{p} = 1 \text{ Year's Interest, } \frac{rSx}{p} = \text{whole}$

$$\text{Interest, and } \frac{4rSx}{p} = \text{what the Lady is to receive; } \frac{S + rSx - 4rSx}{p} = \frac{S}{p}$$

per Annum. Therefore, $px = \frac{pS - S}{3rS}$, the Years required. Now, suppose

1000*l.* is put into the Banker's Hands, at 4 *per Cent.* th. $\frac{pS - S}{3rS} = 8\frac{1}{2}$ Years;

If at 5 *per Cent.* = 6 Years and 3-5ths. Therefore, the greater the Interest, the sooner will the Banker get the Lady's Fortune into his Hands. W.W.R.

Mr. Fininley answers it thus, — If $S =$ the Sum = 1000*l.* 4 Times the simple Interest thereof at 5*l. per Cent.* is 200*l.* which is to be paid yearly;

$\frac{1000}{200} = 5$ Years, which is what the Banker is to gain; then 990*l.* added to the

simple Interest of 1000*l.* at 5 *per Cent.* = what she is to receive. Put $t =$ the Time of her Life, and we have, 200*l.* : 1*Y.* :: 90+50*l.* : t ; whence,

multiplying Extremes and Means, we have, by Reduction, $t = \frac{990}{150} = 6.6 = 6$ Y. 219 d. required.

Mr. Wells argues thus. — Suppose (says he) 100*l.* (= S) be put into the Banker's Hands; let $r = .5$, the Interest of 1*l.* for 1 Year at 5 *per Cent.* $t =$ the Time required. Now, suppose the Banker to make *lawful Interest* of the Money put into his Hands, during the Lady's Life, he then loses 3*Y.* yearly, the Principal. Whence, as 1 : 3*Y.* :: t : $S - t$, by *Quest.* Therefore, 3*Y.* =

$S - t$, and, by Reduction, $t = \frac{S - 1}{3r} = 6.6$ Years. (Agreeing with Mr. Robinson's and Mr. Fininley's Answer foregoing.) W. W. R.

Mr. Wells observes, that $6.6 \times 4r = 132$ *l.* what the Lady receives during her Life; and, as 1 *Y.* : 5*l.* :: 6.6 *Yrs.* : 33*l.* the Interest of 100*l.* for 6.6 Years; therefore, $100 + 33 = 132 = 1$ *l.* the Banker's Gain at last; being 1-hundredth Part of the Principal he received from the Lady.

Remark. Compound Interest to both Parties ought to be allowed in these Cases, as for the Purchase of Annuities; the Banker to be allowed compound Interest, for the Lady's Life, for 4 Times as much simple Interest more, paid her yearly, than the simple Interest came to; and the Lady to be allowed compound Interest for her Money advanced, considering the Banker's Gain at last on the Contract made between them. Hence only Mr. Congbron's Answer is deduced from true Principles, and is a most accurate Way of Reasoning and Conclusion, eminently and excellently performed. Yet Messrs Robinson's, Fininley's, and Wells's, Answers, on the Principles of simple Interest, and agreeing with each Other, are not without their particular Merit, according to the Principles on which they proceeded, — PALLADIUM-AUTHOR.

XII. QUESTION 483, answered by Mr. George Coughron.

IT has been shewn in former *Palladiums*, (*viz.* for 1767 and 1771,) that the least Number that is *divisible* by each of the Times of Revolution, without a Remainder, is the Answer; whence $2 \times 7 \times 8 \times 9 \times 5 \times 11 = 55440$ Hours = 2310 Days, is the Time in which the several Hands will be all conjoined, and is just Half the Time that Mr. Ferguson makes it.

Observation. Mr. Ferguson, who is a Lecturer on experimental Philosophy, should rectify this Error to his Pupils, and account (*modestly, as not being infallible*) for his Mistake. PALLADIUM-AUTHOR.

Mr. Harrison answers it in the same concise and correct Manner; as did Mr. Shadgett, who determines, that A had performed 2310, B, 2520, C, 2772, D, 3080, E, 3465, and F, 3960, complete Revolutions, at the next Time of their Conjunction.

Conjunction. Mr. Eggington has elegantly performed the same, coming to the same Conclusion with Mr. Coughron. Mr. James Hartley performed it by a very concise and universal Rule. Mr. Lamb finds the Time and Number of Revolutions shortly; as did the ingenious Mr. Hayes; Mr. W. Wilfon; Mr. Hardy, who also determined the Hours to be 6 y. 4 m. 2 w. at the next Conjunction, which Mr. Nicholson determines to be 6 y. 4 m. 1 w. (by abating one Day for the Leap-Year contained in 6 Years) for the Distance of Time required; who refers to the Remark, P. 39, Pal. 1773. Mr. Fininley (in his Book of Solutions to most of the Questions) determines, very judiciously, the exact Time and Number of Revolutions performed by each Hand. Mr. Robinson gives the exact Time, and also Mr. Taylor; but one of our capable Correspondents, by Inadvertency or Inattention, sends the Time 1330560 Hours = 55440 Days =

151 $\frac{1149}{1461}$ Years; observed (without Name) for general Caution. Mr. Pen
[gives $7 \times 8 \times 9 \times 10 \times 11 = 55440$ Hours.

XIII. QUESTION 484, answered by Mr. George Coughron.

PUT s for the specific Gravity of the Metal, (which ought to have been given,) that of Water being Unity; then, since the Sphere sinks to its Center, its specific Gravity must be $= \frac{1}{2}$, viz. Half that of Water, and therefore the Content of the whole Sphere, to the Solidity of the metal Part thereof, is as $s : \frac{1}{2}$, or to the Content of the Vacuity, as $s : s - \frac{1}{2}$; whence, Spheres being

as the Cube-Roots of similar Dimensions, we have, as $\frac{1}{2} : s - \frac{1}{2} \Big| \frac{1}{2} ::$ the outside Diameter of the Sphere : the Diameter of the Vacuity; and consequently,

by Division, &c. $\frac{1}{2} - s - \frac{1}{2} \Big| \frac{1}{2} : \frac{1}{2} ::$ twice the Thickness of the Metal outside Diameter of the Sphere = 31.80 &c. Inches, when $s = 9.00$, or the Metal, Copper.

Mr. Robinson's Answer, the Proposer. — A Copper concave Sphere. Put $c = 0.3171653$, $d = 0.036169$, the Weights of a cubic Inch of Copper and Rain-Water, respectively, $b = 3.1014$, $x =$ the inside Diameter, $x + 26 =$

the outside Diameter, $p = .5236$. Th. $p \times \overline{x + 26}^3 =$ the Sphere's Solidity, $p \times \frac{x + 26 \Big| 3}{2}$ solid Inches to be immersed, or Water to be removed,

$pd + \frac{x + 26 \Big| 3}{2} =$ the Weight of the Copper or Water to be displaced; $pd +$

$\frac{x + 26 \Big| 3}{2c} =$ cubic Inches of Copper in the Sphere. Th. $6p \times \overline{x + 26}^2 =$

the square Inches in the Sphere's Surface. Therefore, pd multiplied by $\frac{x + 26 \Big| 3}{2c}$ $\Big) 6p \times \frac{x + 26 \Big| 2}{1} \Big(= \frac{12c}{d \times x + 26} = b. \Big)$ Th. $x = \frac{12c - 26^2}{db}$

= 34.807 Inches, the inside Diameter, and 35.407 Inches = the outside.

Mr. Roue says that the Kind of Metal ought to have been given; who supposing it to be cast Brass, finds x , the inside Diameter, = 28 Inches nearly.

Mr. Harrison makes the inside Diameter = 29.4 Inches, and 30 Inches the outside Diameter, by a short Process. Mr. Lamb, by a short Process, finds 31.54485 Inches, the Sphere's Diameter, supposing it to be Copper. Mr. Hayes finds the Sphere's outside Diameter (supposing it to be Copper) 31.2 Inches; but if cast Iron, then the outside Diameter = 24.59. Mr. Wm Wilfon

gives a Process but no Numbers; Mr. *Draper* the same. Mr. *Hardy* gives the Sphere's Diameter (supposing it Copper) 32.4 Inches, as deduced by Mr. *Judson*, of *Beverly*; but gives it, from his own Deduction, by a short Process, = 31.79144, (the Rain-Water to Copper being as 1 to 9,) nearly agreeing with Mr. *Coughron's* Answer, whose Solutions are classical. Mr. *Fininley*, in his Manuscript Book of Solutions, (supposing the Metal *Brass*,) finds the Diameter of the Sphere to be 28 Inches nearly, by a Process similar to Mr. *Coughron's*.

XIV. QUESTION 485, answered by the Palladium-Author, jun.

THE $\frac{1}{777600000}$ Part of 1 Minute of a Degree = 1 vi. of a Degree.
Log. Tang^{ts}.
Log. Tang. of 1' = 6.4637261293 (see p. 54. Pal. 1773.)
Sub. Log. of Numb. 777600000 = 8.8907563
Nat. Tan. .003740846, of 1 vi. 3.5729698 = Log. Tan. 1 vi. =
Log. $\frac{1}{777600000}$ Part of 1'.

. Of all our ingenious and numerous Correspondents, not one of them so much as attempted a Solution to this easy Question; which was proposed to shew what was with Reason apprehended, that the Use of *Logarithms* is not yet in so many Hands as might be expected.

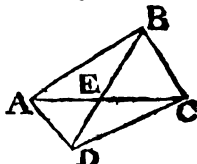
XV. QUESTION 486, answered by Mr. George Coughron.

THE Numbers of different Ways that *n* (5) Things, with two Faces each, can come up, in one Trial, is = 2^n ; and therefore the Probability, that not one of any Number *m* (2) particular Ways, (*viz.* all Heads or all Tails,) of these coming up in one Trial, will be $\frac{2^n - m}{2^n}$; and, consequently, that not a of these will happen in *r* (5) Trials = $\frac{2^n - m}{2^n}^r = \frac{2^n - m}{2^{nr}}$ = (in the present Case) $\frac{2^5 - 2}{2^{25}} = \frac{15}{16} \Big| 5 = \frac{759375}{1048576}$ = the Probability, that, the 5 Guineas shall not come up all Heads or Tails in 5 Trials; and therefore that of the contrary = $1 - \frac{759375}{1048576} = \frac{289201}{1048576}$; whence the former Probability is to the latter, as 759375 to 289201, (being as 2.6257689 &c. to 1,) and the Value of A's Expectation of the Stake (£.115.5) is $\frac{759375}{1048576} \times 115.5 =$ £. 83 6447, &c. which taken from the Sum he staked, 105l. leaves 21l. 7s. 1d. $\frac{1}{2}$, for his Disadvantage, or B's Advantage. W. W. R.
Mr. *Fabius*, the Proposer, answered it by a short and accurate Method, in the same Numbers, correctly. — All the Rest of our Correspondents Answers to this Question are imperfect and wide of Truth.

XVI. QUESTION 487, answered by Mr. George Coughron.

CONSTRUCTION. Take AC, the greater Diagonal (40), which divide at E, in the given Ratio of the Parts into which the lesser Diagonal divides the Area,

Area, (2 to 3); through E draw BED = the lesser Diagonal (30), so as to be divided in E in the Ratio of the Parts into which the greater Diagonal divides the *Area*, (1 to 3,) and to make the Angle BEC = the given one, (76°); join the Points, A, B, C, D, and ABCD will be the Trapezium required. For, the Δ s, BAD, BCD, ABC, ADC; having respectively the same Bases, BD, AC, are as their Heights; and these again, as EA, EC, EB, ED, which, by Construction, are as the respective Parts, into which the lesser and greater Diagonals divide the *Area*. Q. E. D.



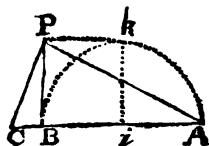
Calculation. By Rule 2, P. 69, of Mr. Hutton's *Mensuration*, the Area is = $\frac{1}{2}AC \times BD \times \text{Sine } \angle E = 20 \times 30 \times \text{S. } \angle 76^\circ = 582.17742$ Chains = 58 A. 0 R. 34.8387 &c. Perches. — And since, in each of the Δ s, AEB, BEC, CED, DEA, two Sides and the contained $\angle$ are given, the other Side of each, or the Sides of the Trapezium, may therefore be easily found, when it is known whether AE or EC, BE or ED, is to be the greatest.

SCHOLIUM, which ought to have been before the Calculation. — The Diagonals divide each other, reciprocally, as they divide the *Area*.

Mr. Harrison answered this Question by a Process and Calculation, making the Area 58 A. 0 R. 34.4387 Perches. Mr. Ward, by a Process and Calculation, makes the Area 58 A. 0 R. 35 P. nearly, confirming one another. Mr. Fininley, by a Process and Calculation, makes the Area = 58.875 A. Mr. Wm Wilson, by a Process and Calculation, makes the Area = 57 A. 1 R. 27 P. Mr. Robinson, by a concise and correct Process and Calculation, makes the Area = 58 A. 0 R. 34.880 P. confirming the Truth of Messrs Harrison's and Ward's Solutions. Mr. Nicholson gives a true Process. Mr. Hayes, by a Construction and Calculation, finds the Area = 58 A. 0 R. 35 P. agreeing with Messrs Harrison's, Ward's, and Robinson's, Answers; shewing the Necessity of giving Numbers to Processes, for making Comparison and determining Truth by Agreement. Mr. Lamb, by a correct Process and near Calculation, finds the Area = 58 A. 0 R. 33.8784 &c. P. Mr. J. Turner and Mr. Fifer, Pupils to Mr. John Hart, answered it. Mr. Rowe finds (by an easy Process and Calculation) the Trapezium's Area = 58 A. 0 R. 34.83872 &c. P.

XVII. QUESTION 488, answered by Mr. Thomas Robinson, of Biddick.

FIRST, $PB = \frac{1}{2}AB$; put $b = 210$; p and q = Sine and Cof. of 80° ; $u = PB$; $2u = AB$; x and y = Sine & Cof. $\angle A$; Rad. = 1. Then, by Trigonometry, we have, as $x : u :: y : 2u$. Th. $2x = y$, and $qx + 2px = \text{S. } \angle C$. As $2x : 2u ::$



$2 : \frac{u}{x} = AP$; and, as $qx + 2px : u :: 1 :$

$\frac{u}{qx + 2px} = PC$. Th. $\frac{u}{qx + 2px} + \frac{u}{x} = b$. Hence, $u = \frac{b \times qx + 2px}{1 + q + 2p}$

= PB. Then $AP = \frac{u}{x} = \frac{b \times q + 2p}{1 + q + 2p} = 163.7$ Leagues, and $CP = 76.3$

Leagues. Hence, $PB = 73.2099$; $AB = 146.4198$; $CB = 21.494$. Likewise, the $\angle A = 26^\circ 33' 54'' 12'''$, the Cosine of the Course of the Ship from A.

Mr. Lamb gives his analytical and numerical Solution, but differs from Mr. Robinson. He makes the Distance from A and C sailed to P = 181 and 59 Leagues respectively; and putting the Distance, sailed by B, a mean Proportional

Obtain between A and C, the B's Distance = 103 $\frac{1}{2}$. The *Ref* he finds by plain Trigonometry, viz. A sails a Course W.N.W. 3° 41' Westerly; B sails N.W. by W. 43' Northerly; C sails North 8° 48' Easterly. The Distance between A and B he makes 86.46 Leagues; between B and C, 93.94 Leagues.

Mr. Rowe tells us, that this *Question* is not limited; and therefore assumes the $\angle PCA = 20^\circ$, or its Complement 70° , and so proceeds, by various Steps, (and reading C for B in the 6th Line of the *Question*, not the Proposer's *Question*.) he determines Nothing to be compared; and without Comparison of Numbers agreeing there is no Certainty in *Processes*.

XVIII. QUESTION 489, answered by Mr. Thomas Robinson.

$$\frac{105}{200 \times \frac{3.14159}{180}} = 60^\circ 23' 48'' = \angle \text{ at the Center. By Trigonometry,}$$

the Sine of the Arch = 50.173 = c ; Cosine = 86.502 = b ; versed Sine = 13.498 = m ; Radius = 100. Put x = the Distance from the Extremity of the Arch, on the Chord, (being Part of the Sine,) to the Side of the inscribed Parallelogram in the Sector; $c-x$ = the remaining Distance to the End of the Sine, (or remaining Part of the Sine.) Let y the Distance between the Middle of the Side of the inscribed Parallelogram (next the Arch) and the Arch; then $m-y$ = the Diff. between the versed Sine and that Dist. or the Distance between the Middle of the Chord and End of the versed Sine next

the Chord. Then, by the Circle's Property, $2dy-y^2 = c^2-x^2$. Th. $y^2 =$

$$2dy = 2cx - x^2 - c^2, (d^2 - c^2 = n.) \text{ Then, } y = d + \sqrt{2cx - x^2 + n};$$

$$m-y = \sqrt{2cx - x^2 + n} - b; \text{ by similar } \Delta s. c : b :: x : \frac{bx}{c} = \text{the Dis-}$$

tance from the $\angle$ of the inscribed Parallelogram, next the Sector's Center, to

the Chord of the Arch. Hence, $\frac{bx-bc}{c} + \sqrt{2cx - x^2 + n} \times \frac{c-x}{c} = \text{the}$

Area of the required Rectangle, which is to be a Maximum. Put into Fluxions and reduced, the longest Side of the inscribed Rectangle (parallel to a Line drawn from the Circle's Center to the Middle of the Sector) will be found = 53.559, and the shortest, or Breadth, = 25.084. W. W. R.

Mr. Finicky has given a very elaborate Process without a numerical Conclusion, and therefore to no Purpose, as not to be relied on without a comparative Proof.

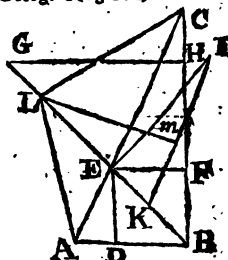
Mr. Coughron observes, that, as this *Question* only proposes to Inscribe the Rectangle of the greatest Area in a Sector, it will be a good Exercise for Learners of Fluxions, when they engage with the Maxima and Minima of Quantities.

Mr. Stephen Hartley finds (by the Arithmetic of Fluxions) the longest Side of the Rectangle = 53.938, very near Mr. Robinson's Number; whence the other or shortest Side will be near 25.084, as found by Mr. Robinson.

Mr. Mascroft determines the Sides of the Rectangles (by fluxional Arithmetic) 51.774 = the Breadth, and 51.912 the Length. Mr. Rowe makes the Breadth 48.16, and Length 56, as near Numbers. Mr. Wm Wilson gives a Process, without Numbers to prove it. Mr. Hayes finds, by fluxional Arithmetic, one of the Sides = 50.12, and the Area of the Rectangle = 2897. Mr. Hardy makes the Sides 51.89932 and 51.773591. Mr. Robert Arnold, junior, finds the Sides of the greatest inscribed Parallelogram 51.912 and 51.774; shewing the Use of Comparison.

XIX. QUESTION 490, answered by Mr. George Coughron,

CONSTRUCTION. Produce the Diagonal, BE, of the given Square, BDEF, till BG = the given Hypotenuse; draw GH || BD, and EI perpendicular to BE = GH; also IK to the Center of BE; and take KL = KI; from L, with the Radius GH, intersect BC in C; draw CEA; and ABC will be the Δ required.



Demonstration. Let Lm be perpendicular to KI; then, the right-angled Δ s, KEI, KmL, having equal Hypotenuses (per Construction) and the $\angle$ H common, must be equal in every Respect; and, of Course, KE = Km; and Lm a Tangent to a Circle inscribed from K through EmB; whence, (Eucl. 3. 36.) BLXEL = Lm² = LC², and therefore, BL : LC :: LC : LE; consequently, the Δ s LCB, LCE, are similar, (Eucl. 6. 6.) and therefore, $\angle$ LCE = $\angle$ LCB = $\angle$ LBA; whence the Circumference of the Circle may be described through all the 4 Points, C, B, A, L, (Eucl. 3. 21.) hence the Δ s CAL, CBL, (= BGH,) standing upon the same Subtense, CL, must be equal, and therefore $\angle$ CAL = $\angle$ LCA; and, consequently, the Δ ALC is Isosceles, and similar to BHG; but LC = GH, (per Construction,) whence AC must be equal to BG. Q. E. D.

Calculation. In the right-angled Δ BHG, are given the Hypotenuse and $\angle$ GBH = 45°, to find GH = EI; and, in the right-angled Δ KEI, are given the Legs, KE, EI, to find the Hypotenuse KI = KL; also, in the Δ BLC are given BL, LC, and $\angle$ B, to find BC; from whence $\angle$ ACB may be found; and thence, AB, BC. — All these Calculations may be made by Trigonometry,

without extracting Roots. W. W. R. But GH (= BG $\sqrt{\frac{1}{2}}$) and HI (= $\sqrt{KE^2 + EI^2} = \sqrt{KE^2 + GH^2} = \sqrt{\frac{1}{2}BD^2 + \frac{1}{2}BG^2}$) may be taken indifferently by the Square Root. W. W. R.

I could have given the Construction and Demonstration in far fewer Words, if, instead of shewing how to find the Point E, I had said, — Upon BE, produced, take L so, that, BL : GH :: GH : EL. — But there would be Nothing gained by this; and, besides, the Calculation (the Thing required) appears more clearly from the above.

As this Question was proposed general, without Numbers, Mr. Coughron has given a general and satisfying Answer.

Mr. Fininley has given a very good Solution, (with an Example,) but not without the Extraction of Roots.

Mr. Stephen Hartley answers this Question as follows. — Make the Hypotenuse of the given right-angled Δ the Diameter of a Circle, and the other Sides to meet in the Periphery; draw the Perpendicular BH, and put DE = a, AC = b, and BO = x. Then, by similar Δ s, x : a :: a + x : b. There-

fore, $x = \frac{a^2}{b-a}$, whence OH, (the Difference between BO and the Perpendicular,) the Side of the inscribed Square is had without Extraction of Roots.

Mr. Rowe solves the same by a simple Quadratic, and leaves it to the Proposer (he says) to give a more simple Solution. — Mr. Robinson finds the Side of a Square, but not without Extraction.

The Proposer, Mr. Johnson, gives this Solution. — Put b = AC, the Hypotenuse; and = DE = EF, the Side of the Square; x = the nat. Sine $\angle$ A; then,

then, since $\angle C = \sqrt{1-x^2}$, per Trigonometry, x

$s :: 1$ (Rad.) $\frac{s}{x} = AE$, and $\sqrt{1-x^2} : s :: 1$

$\frac{s}{\sqrt{1-x^2}} = CE$; hence, $\frac{s}{\sqrt{1-x^2}} + \frac{s}{x} = b$;

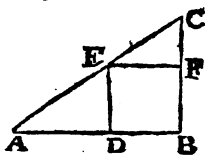
and th. $\frac{1}{\sqrt{1-x^2}} + \frac{1}{x} = \frac{b}{s}$. But $\frac{1}{\sqrt{1-x^2}} = \text{nat. Secant}$, and $\frac{1}{x} =$

Co-Secant of $\angle A$; therefore, we need but find, in the Tables, an Angle,

whose Secant and Cosecant, when added together, shall be $= \frac{b}{s}$. Thus, sup-

pose $b = 36$, and $s = 12$, then $\frac{b}{s} = 3$; and, looking in the Tables of nat.

Secants, I find $\angle A = 56^\circ 10'$; when the Rest are easily found by Trigonometry. W. W. R.



XX. QUESTION 491, answered by Mr. George Coughron.

DIVIDE the Semidiameter of a given Circle into 7 equal Parts; and, at the End of the Diameter, next to the Radius, divided into 7 equal Parts, raise a Perpendicular thereto, equal to 3 Times the Radius and 1 of those Parts into which it is divided; join the Extremity of the Perpendicular and the contrary End of the Circle's Diameter, and the Space, contained by the Diameter, Perpendicular, and Hypotenuse, will be that of a right-angled Triangle, equal to the Area of the said Circle.

This Solution is evidently founded on the Ratio of the Diameter to the Circumference, as 1 to 3 1-7th, or as 7 to 22; and gives .7857 &c. for the Area, when the Diameter of the Circle is Unity; which is only .0003 (=

$\frac{3}{10000} - \frac{1}{3333}$) Part too much; and therefore but 1 too much in 3333. [W. W. R.]

Mr. Fininley's Answer. — Let the Diameter of a Circle given be divided into 14 equal Parts, (and consequently the Radius into 7;) and, at 11 (or 3) of those Parts, raise a Perpendicular to the Circle's Periphery; then, from the Intersection of that Perp. and Periphery, draw a Line to the End of the Circle's Diameter, where 11 Parts were reckoned from; and it will be the Side of a Square equal to the Area of the Circle given, very nearly. W. W. R.

Capt. Williams's Answer, of Woolwich, the Proposer. — Draw the Diameters of any Circle at right Angles to each Other, and produce them, each Way, beyond the Circle, till the produced Part of each Diameter is equal to one-fourth of the Radius; so will the 4 Points, when conjoined, (by straight Lines drawn between them,) form a Square nearly equal to the Area of the Circle.

Demonstration. If the Diameter of the Circle = 1, its Area = .785398 &c. by a known Proof. Also the Diagonal of the Square = $1 + \frac{1}{4} =$

$\frac{5}{4}$, by Construction. Therefore the Area = $\frac{5}{4} \times \frac{5}{8} = .78125$; and the

Circle (.785398 &c.) exceeds the Square only by .004148 Parts of the whole

Circle; [viz. by $\frac{4148}{1000000}$ Parts = $\frac{1}{241}$ Parts of the Whole;] and conse-

sequently this Construction is sufficiently accurate for any mechanical Purpose; Q. E. D.

Demonstration. Put the *Impetus* $\equiv$ 1 Yards, Time of *Flight* for the greatest horizontal *Range* (with the *Impetus* 1) $\equiv$ F Seconds, $\frac{1}{2}\sqrt{61}$ Sine of Elevation above the Plane, *viz.* ADIT $\equiv$ P; the *Cofine* of Inclination. AMO, $\equiv$ c; and the Time of *Flight* on the Plane, MA, $\equiv$ f Seconds. Then, by the

Doctrine of Projectiles, will $f = \frac{FP}{C} \sqrt{2}$; whence this Analogy, C : P ::

F $\sqrt{2}$: f. Now, in the above *Construction*, MT $\equiv$ F; and therefore Mt $\equiv$ F $\sqrt{2}$; and the Rest of the *Analogy* is founded in the Δ MAT, *therof. &c.*

Observation. The ingenious Author has remarked to us, in one Part of his Letter, that the above *Question* admits of an elegant geometrical *Construction*, by the *Artifice* of rejecting 1-12th from 16 1-12th Feet, which Bodies are found to fall in the 1st Second of Time, by Experiment; the 1-12th rejected being no Error in Practice.

Mr. Rowe puts $a \equiv$ the *Impetus*, or Height of the perpendicular Projection; $b \equiv$ *Cof.* of the Plane's Elevation or Depression above or below the Horizon; $c \equiv$ Sine of the Angle of Elevation or Depression of the Piece; then $d \equiv$ the Space described by a descending Body in 1 Second of Time. Then, (by Holliday's

Gunnery, p. 164.) the Time of *Flight* will be $\equiv \frac{2c}{b} \sqrt{\frac{a}{d}} (= \frac{ce}{bd}$; e being

the *Projectile's Velocity*, at the Beginning of its *Flight*, measured by the Space it describes *per Second*) required.

XXII. QUESTION 493, answered by Capt. Williams, of Woolwich, the Proposer,

1. LET there be prepared, with great Accuracy, a Mortar, a solid Shot, and a sufficient Quantity of Powder, in Order to preserve an uniform Force as nearly as possible.

2. Choose a convenient Situation, Aap, where Aa

is a horizontal Plane, and ap the Side of a Hill or Mountain. Then, at the several Stations, A, B, C, &c. let several Projections be made, with every Circumstance the same, striking the Hill in the Points, a, b, c, &c. respectively; and let the Angles, aBb, aCc, &c. and Bba, Cca, &c. be observed, with the Distances of the Stations, they will determine the Amplitudes, Bb, Cc, &c.

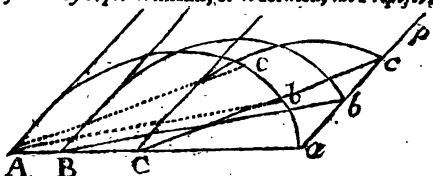
3. Draw, through A, Parallels to the several Amplitudes; and, on each Parallel, set off its respective Amplitude, *viz.* Ab', Ac', Cc', &c. which will determine so many Points in the required Curve; and, if another Series of similar Experiments be made upon the Descent, the Part of the Curve, below the Horizon, may in like Manner be determined.

4. The Vertex of the Curve must be determined by observing the greatest Angle of Altitude of the Shot, &c.

The Angle, at which the Projection strikes the Ground, may be determined by causing the Shot to pass through a Stage of a sufficient Height, or by making it fall into a Pit of Clay, or by both; which, by the by, might also, in some Measure, ascertain the Velocity of the Shot at its entering the Clay.

Observation. The Note, from Emerson's Fluxions, (Cor. 4. Prop. 19.) at the Bottom of this Question, (P. 71. Pal. 1773,) belongs to the former Question, mistranscribed.

REMARK.



REMARK. These Kinds of Experiments are certainly very necessary to be made, for improving the important Art of Artillery. PALLADIUM-AUTHOR.

XXIII. QUESTION 494, answered by Capt. Williams, the Proposer.

PUT $\left\{ \begin{array}{l} \text{Sine} \\ \text{Cofine} \end{array} \right\} \left\{ \begin{array}{l} \text{Time of the 3d} \\ \text{Observ. fr. Noon} \end{array} \right\} \left\{ \begin{array}{l} x \text{ Sine} \\ y \text{ Cof.} \end{array} \right\} \left\{ \begin{array}{l} \text{Time betw.} \\ \text{1st \& 3d Obs.} \end{array} \right\} \left\{ \begin{array}{l} S \\ C \end{array} \right\} \left\{ \begin{array}{l} \text{and bet.} \\ \text{2d \& 3d} \end{array} \right\}$
 Also put Sine $\left\{ \begin{array}{l} \text{1st} \\ \text{2d} \\ \text{3d} \end{array} \right\} \left\{ \begin{array}{l} \text{Altitude} \\ A \\ a \end{array} \right\}$ and let $\left\{ \begin{array}{l} \text{Sine} \\ \text{Cof.} \end{array} \right\} \left\{ \begin{array}{l} \text{Latitude} \\ \text{Declin.} \end{array} \right\} \left\{ \begin{array}{l} x \\ u \end{array} \right\}$
 Then will $\left\{ \begin{array}{l} \text{uncy} - \text{unSx} + \text{mx} = A \\ \text{uncy} - \text{unSx} + \text{mx} = a \\ \text{uny} + \text{mx} = A \end{array} \right\}$ From which 3 Equations, properly reduced, there will result $\frac{x}{y} = \frac{DQ - dq}{ds - DS} =$
 Tan. of the Hour- $\angle$ from Noon at the 3d Observation.

From whence, the Latitude is found by solving a Case in oblique spherical Triangles. In which Theorem, $D = A - a$; $d = A - a$.

$Q = 1 - C$
 $q = 1 - c$ } = the versed Sines of the above Times.

N. B. From this Theorem, a Set of Tables may easily be made to determine the Latitude in a concise Method than any other I have yet met with. W.W.R.

Observation. What will then become of those Tables by Cornelis Doves, of Amsterdam, copied by Mr. Maskelyne, with a few Additions, from Mount and Page's Books, into the Nautical Ephemeris, requiring a tedious Operation to little Purpose? PALLADIUM-AUTHOR.

Mr. Coughron's Answer, with his Investigation of the Proposer's Theorem for solving it.

Put Sine $\left\{ \begin{array}{l} \text{Time of 3d} \\ \text{Cof.} \end{array} \right\} \left\{ \begin{array}{l} x \text{ Sine} \\ y \text{ Cof.} \end{array} \right\} \left\{ \begin{array}{l} \text{Time betw.} \\ \text{1st \& 3d Obs.} \end{array} \right\} \left\{ \begin{array}{l} S \text{ Sine} \\ C \text{ Cof.} \end{array} \right\} \left\{ \begin{array}{l} \text{Time betw.} \\ \text{2d \& 3d Obs.} \end{array} \right\}$
 Sines $\left\{ \begin{array}{l} \text{1st} \\ \text{2d} \\ \text{3d} \end{array} \right\} \left\{ \begin{array}{l} A \\ a \\ A \end{array} \right\}$ respectively. Sine Declin. $\left\{ \begin{array}{l} m \text{ Sine} \\ n \text{ Cof.} \end{array} \right\}$ Latitude $\left\{ \begin{array}{l} x \\ s \end{array} \right\}$
 (retaining the Proposer's Substitution.)

Then will $Cy \pm Sx$ } Cofines of the Times from Noon
 $cy \pm sx$ } at the first and 2d Observations.

Therefore, (by P. 211, Emerson's Trigonometry, 2d Edit.) $\left\{ \begin{array}{l} \text{unX Cy} \pm \text{Sx} + \text{mx} = A \\ \text{unX cy} \pm \text{sx} + \text{mx} = a \\ \text{uny} + \text{mx} = A \end{array} \right\}$ By taking the 1st and 2d of these from the third, we have unX
 $\frac{1 - c}{1 - c} \times \frac{y \pm sx}{y \pm sx} = \frac{A - a}{A - a} \times \frac{1 - C}{1 - C} \times \frac{y \pm Sx}{y \pm Sx} = A - a$; and unX

$1 - c \times y \pm sx = A - a$; and, by multiplying these Cross-ways, (viz. the

former Part of one into the latter Part of the Other,) we have $A - a \times$

$\frac{1 - c}{A - a} \times \frac{y \pm sx}{1 - C} = \frac{A - a}{A - a} \times \frac{1 - C}{1 - C} \times \frac{y \pm Sx}{y \pm Sx}$; from whence $\frac{x}{y} = \pm$
 $\frac{A - a \times 1 - C - A - a \times 1 - c}{A - a \times 1 - C - A - a \times 1 - c} = \pm \frac{Dq - dq}{DS - ds} =$ the Tangent of the

Hour-Angle from Noon at the 3d Observation. And, when $D = A - a$, $d = A - a$, $Q = 1 - C$, and $q = 1 - c$, = versed Sines of the Times between the 1st and 3d, and 1st and 2d, Observations, respectively, and that one of the dou-

ble Sines must be taken, which renders the Value of $\frac{x}{y}$ affirmative.

Now, if the Declination be supposed given, (which at Sea is generally known pretty near,) the Latitude may from hence be determined by the Solution of a Case in oblique Spherics; but, in Case the Declination be unknown, the Latitude may be determined thus,

Since

Since $\frac{x}{y}$ is known, x , y , and vn , will all be known; the latter of which, vn , put $= p$; then, from the Equation, $vn^2 + mx = A$, we find $A - py \sqrt{=}$
 $mx^2 = 1 - n^2 \times 1 - v^2 = 1 - n^2 - v^2 + p^2$; hence $n^2 + v^2 = 1 + p^2 -$
 $A - py \sqrt{=}$, which call r ; so shall we have $n^2 \pm 2nv + v^2 = r \pm 2p$, and there-

fore $n \pm v = \sqrt{r \pm 2p}$, and n and $v = \frac{1}{2} \sqrt{r + 2p} \pm \frac{1}{2} \sqrt{r - 2p}$; the upper Sign giving the Value of the greater, and the lower of the lesser. W.W.R.

QUERY. Can a *Navigator* reduce all this curious and elaborate *Theory* to real *Practice* at Sea? PALLADIUM-AUTHOR.

Mr. *Harris* has given a very curious and uncommon *Solution* by the *Tangent*, (or *Sine* divided by the *Cosine*), from *Emerson's Algebra*, p. 448, where this *Question* is proposed and solved in an elegant Manner; but, as we do not think any of these *Solutions* reducible to *Practice* at Sea, it happens well that we are forced to omit those we have not Room for.

Mr. *Rowe* gave a *practical Answer* (as he calls it) by the Sun's lesser geometrical mean Altitude, taken between two adjacent Altitudes, observed, with the Angle from Noon, at the greater and lesser mean Altitude, and Sun's Declination at the mean Time. But, as the true Time from Noon depends on, or is determined by, the *Latitude* in Question, we cannot see its Utility in *Practice*.

Mr. *Rowe* remarks, that Mr. *Hartley's Notation*, P. 41, *Pal.* 1773, should have been like that of Mr. *Robinson*, P. 42, when corrected; viz. for *Cof.* $74^\circ 10'$, read *Cof.* $35^\circ 50' 30''$; and, for *Cof.* $51^\circ 6'$, r. *Cof.* $38^\circ 54' 45''$. Then the *Colatitude* comes out from his final Equation $= 39^\circ 10' 39''$; and hence that *Lat.* $= 50^\circ 49' 21''$; then agreeing with the Other's *Latitude*, P. 41 of the said *Palladium*, 1773.

XXIV. QUESTION 495, answered by Mr. George Coughron.

PUT a and b for the Length and Breadth of the *Rectangle* $= 40$ and 30 Yards, and m and n for the Height of the raised Earth, and the Depth of the Ditch $= 1$ and 2 ; and x for twice the Breadth of the Ditch. Then will

$a - x \times b - x$ and $a + b - x \times x$ be the *Area* of the remaining *Ground* and of the *Ditch*, respectively. Consequently, $m \times a - x \times b - x = nx \times a + b - x$;

from whence, $\frac{1}{2}x = \frac{a+b}{4} - \frac{1}{2} \sqrt{\frac{1}{4} \times (a+b)^2 - \frac{abm}{m+n}} = 3.1386 \&c.$

Yards $=$ the Breadth of the Ditch. — Similar Methods of Solution will not give the Answer in several Cases; For, in most irregular Figure, and Curves, the Process will be very difficult; but if, instead of supposing the Ditch every where of the same Breadth, (as in the above Solution,) we supposed its Breadth to vary so, so that all the remaining Field may be similar to the given one, the Solution will be the same in every Case; which take as follows.

Let m and n be as before; and S and s put for any two homologous Sides or Parts of the given Field and the remaining one; then it is evident, that, $m : n ::$ Area of the Ditch : the Area of the remaining Field; and therefore, by Composition, $m + n : n ::$ the given Field : the remaining one $:: S^2 : s^2$.

(*Exc.* vi. 20.) Consequently, $\sqrt{m+n} : \sqrt{n} :: S : s$; and, by Division,

$\sqrt{m+n} : \sqrt{m+n} - \sqrt{n} :: S : S-s =$ the Sum of the Breadth of the
*W*all,

Walk, at the Extremities of s , in the Direction of s ; from whence the Breadth of the Ditch, at any Point, may be easily found.

Corollary. Since, in any regular Polygon, the remaining Field will be similar to the given one, when the Ditch is every where of the same Breadth, the above Proportion gives us (by supposing S = the Perpendicular from the Center of the given Polygon upon one of its Sides) as the Square-Root of the Sum of the Height of the raised Earth and the Depth of the Ditch is to the said Square-Root less the Square-Root of the Depth of the Ditch, so is the Perpendicular from the Center, upon the Side of any regular Polygon, to the perpendicular Breadth of the Ditch. W. W. R.

Mr. Gumley determines the Breadth of the Ditch (by a simple Quadratic) 3.1386 &c. to a Hair. Mr. Finley exactly determines the same Number by a similar Method. Mr. Rouse also answered it. Mr. Dalton shortly answered it; Mr. Stephen Hartley in Mr. Coughron's Number; Mr. Robinson in the same Number; Mr. Harrison in 3.138513. Mr. Watchorne answered it; as did Mr. Perrot, Mr. Ward, Mr. Fatherley, Mr. Wm Wilson, Mr. James Hartley, Mr. Wadforth, Mr. Hayes, Mr. Hardy, Mr. Shaw, Mr. Lamb, and Mr. Taylor.

XXV. QUESTION 496, answered by Mr. Wm Hardy, of Cottingham.

ASSUME a Triangle whose Hypotenuse = 1, Perpendicular = x , and

Base = $x + \frac{1}{2}$, similar to that required. Then, (by 47. c. 1.)
$$\frac{64x^2 + 80x + 25}{64}$$

+ $x^2 = 1$; whence, $x = 0.321811$, and Base = 0.946811; consequently, $6 \times 0.946811 = 5.680866$ Chains, the Base required; and $6 \times 0.321811 = 1.930866$, the Perpendicular required. Whence the Area = 5.4844955 &c. Chains.

Mr. Stephen Hartley finds the same Numbers nearly by the same Method.

Mr. Coughron observes, that to resolve this Question is only from the Difference of two Quantities and the Sum of their Squares (*viz.* the Sines of the acute Angles) to find those Quantities. Mr. Robinson finds the Perpendicular 1.9308 &c. by a simple Quadratic, the Base 5.6808 &c. and Area 5.484 &c. square Chains = 2 R. 7½ Poles; confirming the Truth of the foregoing Solutions. The Proposer makes the Area the same by a short and true Process; (who observes, that the Hypotenuse should have been printed 16 instead of 6 Chains, when the Field's Area comes out 3 A. 3 R. 24 P.) Mr. Finley gave the same Answer by a short Process. Mr. Dalton answered it; as did Mr. Ward, Mr. Muscroft, Mr. Wm Wilson, Mr. James Hartley, Mr. Wadforth, Mr. Lamb, Mr. Nicholson, and Mr. Hayes, who observes, that the Rectangle of the Sine of the acute Angles of a right-angled Triangle, multiplied into the Square of the Hypotenuse, is equal to twice the Area of that Triangle; a new discovered Property.

XXVI. QUESTION 497, answered by Mr. George Coughron.

BY Quest. $x^2 \cdot 4^x \times 5^x \cdot 2^x =$ a Minimum, and therefore its Log. $8xX + 2xX$

$X + \text{hyp. Log. } 5 = 10xX + 2xX \times \text{hyp. Log. } 5 =$ a Minimum (where $X = \text{hyp. Log. } x$); the Fluxion whereof made = 0, we have $10xX + 2xX \times \text{hyp. Log.}$

$5 = 0$; hence $X = -1 + \frac{\text{hyp. Log. } 5}{5} = -1.3218376$, and therefore $x =$

.26663 &c. from whence the Diameters are found = 1.1657 and .0596, and thence the Area = 0.055595 &c. W. W. R.

Mr.

Mr. Taylor confirms Mr. Coughron's Solution, who makes the Value of π .8666 &c. These 2 are the only true Solutions to this Qu. we have received;

XXVII. QUESTION 498; answered by the Palladium-Author, jun. the Proposer.

IT is well known that any right-lined Figure inscribed in a Circle, (being the most capacious Figure of any other under the same Boundary,) will contain the greatest Area possible. And Mr. Emerson has demonstrated, in Book 4, Prop. 4, of his Geometry, that any Trapezium, being inscribed in a Circle, if each Side be subtracted from the Sum of the other 3 Sides, there will be 4 Remainders; the Product of any 2 of which being taken, and likewise the Product of the other 2, the mean Proportional between those 2 Products, or the Square-Root of the Product of both those Products, or of all the Remainders multiplied together, will be equal to 4 Times the Area of the said Trapezium.

The Fences given are 4, 5, 7, and 9, Furlongs, to enclose the greatest Area. Rem^{rs}.

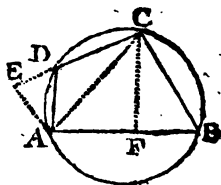
$5+7+9-4=17$
 $7+9+4-5=15$
 $9+4+5-7=11$
 $4+5+7-9=7$

Hence, $17 \times 15 \times 11 \times 7 = 19635$; and $\sqrt{19635} = 140.124944246$ &c. = 4 Times the greatest Area in square Furlongs; $\div 4 = 35.0312360615$ square Furlongs; and $\times 10$ (the Acres in 1 square Furlong) = 350.312360615 square Acres; at 25l. each = £. 8757.809015375 &c. = 8757l. 16s. 2d. 0q. .65476. W. W. R.

Observation. Hence it appears, by the same Product of Remainders, that, whichever Way the 4 Sides are put together, they will comprehend, equally, the greatest Area when inscribed in a Circle.

Mr. Lamb answered this Question by a Method from Simpson's Fluxions and Hutton's Mensuration, amounting to the same as Mr. Emerson's Rule. Mr. Robinson answered it by literal Arithmetic, from a Method in the Gentleman's Diary, 1743, deduced from Simpson's Rules, agreeing with Mr. Hutton's numerical Rule. Mr. Harrison answered it; as did Mr. Mucroft, Mr. Hill, Mr. Perrott, Mr. Eggington, Mr. Fatherley, Mr. Hardy, Mr. Hedley, Mr. Hayes, and Mr. Nicholson.

Mr. Rowe shortly deduces the true Answer (by inscribing the Figure in a Circle) as follows. — Let the given Trapezium, ABCD, be circumscribed by a Circle. Continue the Line CD, and draw the Perp. CF and AE. Then put $AD=4=a$; $DC=5=b$; $CB=7=c$; $BA=9$ Furlongs $=d$; and $ED=x$. Then, by similar Δ s, AED, BFC,



As $a : x :: c : BF = \frac{cx}{a}$. Then, $a^2 + b^2 + 2bx$

$(= AC^2) = a^2 + b^2 + \frac{2cdx}{a}$. Which being reduced, it gives $x = \frac{a^2 + d^2 - a^2 - b^2}{2ab + 2cd} = 2.1445783$. And thence $BF = 3.7530120$; $AC =$

7.9023644 ; $EC = 7.1445783$; and $EA = 3.3765046$ Furlongs. Whence the Area, ABCDA, is $= 35.031236$ square Furlongs. And thence the Value of the Lady's Estate is $= 8757l. 16s. 2d. 0q. .65$ &c. W. W. R.

Mr. Drake made the Acres 350 312; and the Value 8757l. 16s. 1d. $\frac{1}{2}$.

PRIZE-QUESTION, answered by a Practical Navigator, A. A. A. non F. R. S.
 A MECHANICAL METHOD to find the LATITUDE of the SHIP'S PLACE
 at Sea, in the Night, by a large Cœlestial Globe accurately made.

RULE. The Altitude of two Stars being taken, by different Observers, at the same Time of the Night, the Extent of each Zenith-Distance must be taken

taken by the Compasses from the *Quadrant* of Altitude of a large celestial Globe on-board; then, setting one Foot of the Compasses in each respective Star's *Circumference* and turning the other Foot about with that respective *Centre* of each Star's Zenith-Distance; sweep two *Arches* on the *Convex* Surface of the Globe; by Means of a black-lead Pencil fixed to the moving Point of the Compasses; then, the Intersection of these two *Arches* being turned to the *Base* Meridian of the said Globe, it will, at once, shew the *Latitude* of the Place where the Ship is; because the Intersection of any two Zenith-Distances of Stars is exactly at the Zenith of the Place of Observation. Whence, the *Latitude* of the Place, which is the Distance of the Zenith on the *Base-Meridian* from the *Equinoctial*, will be seen; and also the *Complement* of *Latitude*, which is the Distance of the Zenith, on the *Base-Meridian*, to the Pole. FINIS. NOV 2 A

OTHERWISE. — On you may have two *Quadrants* of Altitude exactly fitted to the *Base-Meridian*, so as to turn upon one *Center* on the *Base-Meridian*, and thereon to slide freely backward or Forward, which must be moved till the *Quadrants* of Altitude lie exactly over the two respective Zenith-Distances taken of the two Stars, or exactly coincide with those Zenith-Distances on the Globe: When the *Slide*, on the Globe's *Base-Meridian*, will rest at the *Latitude* of the Ship's Place, required.

By CALCULATION. — The *Latitude* may be determined by a trigonometrical Operation, from the two Altitudes or Zenith-Distances of the two Stars, taken at the same Time (their *Declinations* and *Right Ascensions* being known;) the Result of which Operation should be compared with the *Latitude* found from the mechanical Method, for adjusting or ascertaining the Truth. In Mr. Emerson's *Algebra*, Prob. cix. P. 448. the short and correct Method of Solution may be seen. — This Method will determine the *Latitude* by Night, coming near Land, when it is most wanted to be known; because, in the Day-Time, (except in hazy Weather,) the Land may be generally seen and avoided.

Corrections of P. 473. — P. 31, L. 5, for *bad*, r. *bas*. P. 63, L. 33, for *ancient*, r. *Orient*. L. 36, for *now*, read *now*; L. 37, for *appear*, r. *appear'd*.

Solution of *Question* 400, corrected by Mr. Per, of Chalfont.

BY Rule. P. 48, Feb. 1773, the Solidity of an infinite Number of such Globes = 77 (parting for the Solidity of the 1st and 2d) = 11928.2346066279400 solid Inches; which x'd by 41.447, the Value of 1 solid Inch of Gold, = 4943064.6s. 10d. 0q. 41471536, required. He observes that $45 \times 45 \times 7853981633975 \times 5 \times 5 = 11928.234606599512$ = Solidity of all the Globes, observed. Who remarks, that when the *Altitudes* and *Base* of the Cone are equal, an infinite Number of Globes (so inscribed) is equal in Solidity to Half the whole Cone; which is a curious Property.

This Correspondent's Packet was received last Year; who informs us that he answered several of the *Questions* and *Enigmas*.

The Answers to the *Simple Questions* are reserved for next Year; so must the Account of the *Plunder* of the *Whetstone Calculus*! (Do Justice to a *Tb-f*.) — The Genealogy of a Witch, &c. postponed.

To the *Palladium-Author*. — Sir, By your giving the following a Place, you will oblige many of your Correspondents, and your humble Servant, CRITICUS.

Advertisement. — Wrighten & Redden & Trew spellen, & marchants akounts & Doubel entery, Likewise geograffy, astronomy, Astrology, arethmatik, Mathematiks, navegation, The longestud, And calculation Of the moon, also & Moreover poetree, Heroek Lyrek, Jindarrek And Doggarrell, morels & Behavur, wyt & Humer, Sens & jugment, of the nuist faship, sawt heir by rubin butchur. Posskrap. — Gals & bouys boorded & goot yowatch. I Keps an evenen scoul fur Techen leadys the trew Us of The globs, & i calkeluts nitevetis in a Minemum. And i Taches lat-tin, frensh-tin, and gecke-tin, alsoe shorte hande in 24 howrs Eache At hom or a Brod. Inquier For the gentelmun arther at His libel-Offiz & Registry, on Thee byt, gripitch.

NEW ZEALAND.

I. ENIGMA 241, by Miss Anne Comley, of Countesthorpe, Leicestershire.

COME, come, to sing of me, some way,

With an Ear of Attention regard what I say;

None ever like me could so vary their Shape;

For I'm sometimes an Owl and at others an Ape;

I'm a Dog, or a Cat, or a Fox, or a Mare,

A Sheep, or a Goat, or a Horse, or a Bear;

A Lion, a Tiger, a Bull, or a Cow,

A Coach, or a Waggon, a Harrow, or a Plough;

A Swan, or an Eagle, a Griffin, or Dragon,

A House, or a Tree, or a Bell, or a Flagon,

I'm a Ship, or a Mill, or a Crown, or a Star,

A Sun, or a Moon, or an Ensign of War;

Nay, what is more strange, I'm a King or a Queen,

Adorn'd with a Crown and majestic Reign;

I'm a Gen'ral of War, — yes, a gallant brave Hero,

With Features as fierce and forbidding as Nero.

I'm a Duke, or a Lord, or a mighty Physician,

A Statesman, or Poet, or Mathematician;

A Blacksmith, a Taylor, a Cobbler, or Tinker,

A Plowman, a Butcher, or a Tunbelly Drinker;

A Globe, or a Tan, or a Billet of Wood,

A Shoulder of Mutton, or what you think good.

But, though I'm more harmless by far than a Moose,

No Man will allow me a Place in his House;

So I'm forc'd to endure, in all Manner of Forms,

The Heat of the Sun, and more merciless Storms. —

But hold — for I see you will quickly reveal,

What here without Art I'm about to conceal.

II. ENIGMA 242, by the Rev. T. Vaughan, A. M. Merpeth.

BROUGHT forth by Warmth, and sometimes vital Heat,

I am launch'd forth for many a cruel Feast;

Sometimes I'm pois'd in Air, and soar so high,

I almost reach the Limits of the Sky.

I'm call'd a King, and well deserve that Name,

None of my Kind can equal me in Fame.

I, like the *Basilisk*, can cause Surprise,

And carry Terror in my very Eyes.

Farther to tell, I'm sometimes mild or tame,

Do Things some Subjects would not do for Shame.

In Churches, Chapels, I'm sometimes decreed

To hold the Bible whilst the Priest does read.

III. ENIGMA 243, by Mr. Thomas Sadler, of Whitechurch.

YE fair ones, from the Womb of Earth,

And Beasts, and Trees, we take our Birth;

By Vulcan's Art we're form'd complete,

And often on the Ladies wait.

We traverse all the Nation round,

In ev'ry Part we're daily found.

Attend on ev'ry Maiden fair,

And ornamented well with Hair.

And sometimes deck'd with Silk and Fur,

As Modes of Dress and Taste occur.

Where Fops, Coquets, and *Sally* strut,

We may be found with them on Foot.

We're

We're made to swallow Flesh and Blood,
That do to us but little Good.

We tread about through thick and thin,
And sometimes out, and sometimes in.

We're posted sometimes at a Door,
Attending such as well as Rob.

We wait upon Misses, Poles, and Swags,
With Kees and Sues a-dressing gowns.

We very often make a Clatter, too,
And then Folks wonder what's the Matter.

And often play at Hide and Seek,
Sometimes not wanted for a Week.

With Soppy sometimes will up Stairs,
But never when the going's fair.

Yet, patiently, we Burthen bear
What's said enough out of our Hear.

IV. ENIGMA 244, by Mr. Thomas Sadler.

THAT swiftest Traveller art thou,
From ev'ry Quarter round I go;

Nothing so swift but I pass by,
In Swiftness next to Thought I am;

Thine all my Nanny and Whinnies came,
W. ENIGMA 245, by Gemini of Morpeth.

LADIES: a mighty Warrior I,
You'll say, when you my Name do spy;

For, surpise! I do engage,
And sometimes, too, I mount the Stage.

But this 'tis not with that Doggy,
For Dogs, I help 'em to divine.

Horses and Birds will then yeh Wonder,
And my Brothers teach 'em Numbers.

'Tis said of old, 'he do debate
Himself shall have a higher Place.

Before Promotions hundreds are,
I'm with the best you may see.

But by a Sign of the Cross,
Instantly the whole is done.

For many a Villain does my Honours share:
For so strict Justice does proclaim,

That he's intitled to the same:
And best my Judges have thought fit,

That, in some Cases, I submit.
My Trial over, hapless Fate!

Reigns me to my pristine State.
VI. ENIGMA 246, by Mr. Swift, of Stow.

THE great Musicians strive with me in vain,
To emulate the best, and tire the longest Strain;

Although of Instruments I know not one,
On all I play in Concert, not alone.

Palladium Artists, known for all your Parts,
I, though untaught, can talk of all your Arts.

VII. ENIGMA 248, by Mr. Swift.
BY me my Kindred are improv'd,

But are reduc'd when I'm remov'd.

*Perfection is found in my Shape,
Which all my Kindred cannot ape.*

Whoever sends the best Answer, in Verse, to the following Enigma, before Candlemas-day next, has a Chance, by Lot, to win 5, 4, and 3 Palladiums.

PRIZE-ÆNIGMA, by Mr. Isaac Gumley, of Countesthorpe.

1. YE charming fair Ladies, to serve you my Trade is,
I'm always a Friend to your Set;
If I am but present, the Night is quite pleasant,
Nor Ghosts, nor fiend Demons, perplex.
2. By you I'm approv'd, nay often believ'd,
And oft to Preference am brought;
With your Hands you embrace me, and then you place me,
Where I must not tarry for a Great.
3. There I, without bidding, keep always descending,
Until I can get Nothing lower;
Then quickly I leave you, though seldom do I see you,
And never am seen any more.
4. My Body is slender, and smoothly tender,
And seldom 'bove ten inches long;
Yet when I prove bigger, of me you're more eager,
Because I'm more useful and strong.
5. I'm fair as Miss Fiddle, excepting my Noddle,
For that is as red as a Rose;
From thence flows the Treasure, that gives you such Pleasure,
And makes me be lov'd, I suppose.
6. At Night I'm most us'd, though seldom refus'd
Whenever Occasion requires;
And, like a true Servant, in Diligence I serve,
I mostly perform your Desires.
7. Now, O ye fair Ladies, from what before said is,
My Name you will quickly explore;
Then let it appear in Palladium next Year,
And I'll importune you no more.

Mr. Isaac Gumley, and our other ingenious Correspondents, are desired to excuse us for omitting what we have reserved for next Year's Palladium; not having Room for several of their useful and entertaining Productions in this present Palladium; some of which Productions came too late for Notice, when the Copy was compiled. Most Antiquaries will be printed for next Year's Palladium.

NEW QUERIES.

I. QUERY 235, by Mr. R. C. of the Isle of Wight.

WHERE was the *Magnus Portus* of the Romans in Britain situated?

II. QUERY 236, by Mr. J. H—s, of Newport, in the Isle of Wight.

A Gentleman, possessed of an Estate of 1000*l.* a Year, dying, left his Widow with Child, who was soon after married to a Gentleman of an Estate of 2000*l.* a Year. Two Months after which she was delivered of a Boy. Whose Son is he? which of the two Estates is he apparent Heir to? whether to both, or neither?

III. QUERY 237, by Mr. J. H—s, of Newport.

WHERE was *German Serge* first manufactured?

IV. QUERY 238, by Mr. Isaac Gumley, of Countesthorpe.

SAGACIOUS Friends, inform me whence arise
Those Northern Lights that stream along the Skies?

V. QUERY 239, by Mr. John Harrison, of Helsby, Cheshire.

AT the dreadful Explosion of Gunpowder at Chester, Nov. 5, 1772, it was
remarkable

remarkable that the *Glass*, in all the adjacent Windows, fell *outwards*: What Reason can be given for its not falling *inwards*, and for its falling *outwards* as it did?

VI. QUERY 240, by Mr. J. Stuckfield; of Stepney.

WHAT became of the Ark of the Lord, containing the two Tables of Stone, after being deposited in *Salomon's Temple*, as mentioned in the 8th Chapter of the 1st Book of *Kings*? The *Jewish Opinion* is, that, when the Temple was destroyed, the Earth opened and swallowed it.

NEW REBUSES.

I. REBUS, by Mr. Penn, of Chalfont, Bucks.

TO four-fifths of a *Jade* add a *four-footed Beast*,
And an *Herb* you will find by *Culpepper* carest;
An *Herb* not unknown to *Sophia* the chaste!

II. REBUS, by a Northumbrian.
INVERT a Word us'd for *Immense*,
And then a *male Child* place behind;
A Lady's Name, of Worth and Sense,
You'll see, who's fair and kind.

III. REBUS, by Mr. W. Hurn, of Watton.

THE Ladies Delight, in particular Season,
Is the Place where they go for particular Reason.

IV. REBUS, by the Rev. Thomas Vaughan, A. M. of Morpeth.

TAKE *five Hundred*; add to it two-thirds of a Thing,
Which oftentimes keeps the *Remains* of a King;
Add to all, if you please, the best Part of a Swine,
And they'll shew you a Place that is splendid and fine.

V. REBUS, by Mr. W. Swift, of Stow.

A *Scripture-Measure* will unfold
A *Poet's Name*, well known of old.

VI. REBUS, by Triangulus.

THE Reverse of *to lose*, and Effect of great Heat,
When connect'd will shew you a fine Country-Seat,
Where the libelling Crew their last Office complete.

NEW PARADOXES.

I. (Grammatical) PARADOX, by Mr. R. T. in the Isle of Wight.

ADEPTS, resolve me *this*, (not think it hard;)

With five *square Stones*, to pave *me one square Yard*.

II. (Geographical) PARADOX, by Mr. Stuckfield, of Stepney.

SUPPOSE a Ship sails from a *Port*, (whose *Longitude* is 50° West,) first North 50 Miles, then South 311 Miles; and finds, by Observation, that she is 461 Miles distant from whence she first sailed. Required the Latitude of the Place sailed from, and the Longitude and Latitude of the Place come to?

III. PARADOX, by Mr. W. Jon.

WHERE must a Person stand with his Head and Feet both upward?

IV. PARADOX, by Mr. Isaac Gumley, of Countesthorpe.

I never *came*, and yet am *here*,
Adepts, my proper Name declare.

V. PARADOX, by Miss Polly Stow.

I'M always *past*, yet still to *come*,
And for another I make Room.

NEW QUESTIONS.

I. QUESTION 499, by Mr. Isaac Gumley, of Countesthorpe, Leicestershire.

THE Product of the Sides of a right-angled Triangle is to the Perimeter thereof, as 500 to 1; and the Diameter of the inscribed Circle is to the Base as 1 to 2: Required the Sides and Area of the Triangle.

II. QUESTION 500, by Mr. Gamley.

GIVEN, $\begin{cases} x + y + z = 66 \\ y + y^2 + z^2 = 404 \\ x + x^2 + z^2 = 105 \end{cases}$ To find the Values of x , y , and z ?

III. QUESTION 501, by Mr. Gamley.

Addressed to Miss Polly Stew.

BEAR With, to exercise your Patience;

Find what's lost from these Equations;

And since 'tis in your Pow'r to give,

Oh why should I without it live!

Where x , y , z , denote the respective Letters Places in the Alphabet, discovering my Disress.

$$\begin{cases} x + y + z = 66 \\ y + y^2 + z^2 = 404 \\ x + x^2 + z^2 = 105 \end{cases} \quad \begin{cases} x^2 + y^2 + z^2 = 520 \\ x^3 - x - y + z^2 = 9332 \\ x^4 + x^2 + y^2 + z^2 = 193213 \\ x^5 - x + y + z^2 = 9443 \end{cases}$$

IV. QUESTION 502, by Mr. William Penn, of Chalfont, Bucks.

THE true Standard-Busbel, when heap'd up with Coals,

Supposing these true solid Inches just holds,

What must the right Form of the Half-Busbel be,

So made, that it shall with the whole one agree,

Their Caps in Proportion as One is to Three?

V. QUESTION 503, by Mr. Penn.

A Purchaser bought 2500 Acres of Land, and gave 8*l*. for every Chain in Breadth, and 5*l*. for every Chain in Length; and gave the least Money possible for his Bargain: What were the Dimensions of the Land he purchased? and how much Money did the Purchase cost?

VI. QUESTION 504, by Mr. John Shadgett, of Ross, Herefordshire.

A Country Gentleman intends to erect a *Mastr-Cistern*, whose Content shall be 250 cubic Feet; but, from the Situation of the Place, he is under a Necessity of having the Depth equal to Half the Length, and the Breadth a geometrical Mean between them both. Required the Dimensions of the Cistern.

VII. QUESTION 505, by Mr. Alexander Rowe, of Reginnis, Cornwall.

A Miser, by griping, in Riches abounds,

Who, in forty-five Years, has heap'd ten-thousand Pounds;

Suppose his Coin equal — Half Silver, Half Gold,

What Proportion the Bags* that can each of it hold?

And, Adept*, attend — I have two Queries more;

What's the Weight and the Bulk of each separate Store?

And, when melted together, the Case's Surface shew,

Whose Height to its Base† is as Five is to Two.

† Diameter.

† Inches.

* Each Bag twice as long as broad; as the Superficies of each Coin, separately melted, is in the Form of a Cylinder, whose Length to their Diameter is as 2 to 1.

VIII. QUESTION 506, by Mr. Rowe.

FOR Trial or Experiment,

These* to Miss Stew I now have sent;

And Rowe to Stew I would cement.

$$\begin{cases} x + y + z = 20 \\ x^3 + y^3 + z^3 = 94720 \\ xy + xz + yz = 449 \end{cases}$$

$$\begin{cases} x = ? \\ y = ? \\ z = ? \end{cases}$$

IX. QUESTION 507, by Mr. Rowe.

INVENIRE *Aream recti-anguli Trianguli, quod est Hypotenuse = x^2 , Basi = x^2 , et Catenus = x^2 ?*

X. QUESTION 508, by Mr. George Hicks, of Recaness.

A Tradesman bought a Piece of Cloth for 2*l*. and, by selling it again, he found that he lost 20 per Ct. whereas he expected to have gained as much per Ct. as the Cloth cost him. What did the Cloth cost him, and how much was it sold for?

XI. QUESTION 509, by Mr. Ward, Collector, at Holdbreach-Bar.

AN Officer, in his Ride, a Cistern found,

Whose Top triangular was, the Bottom round;

To find its true Content* he does despair,

And begs some Adept's Skill to make it clear.

* Each triangular Side at the Top = 100 Inches; Diameter at the Bottom, 65; the longest Line within the Cistern, 99 Inches; required the Content thereof in Gallons.

XII. QUESTION 510, by Mr. Thomas Robinson, of Biddick.

A Cone is cut parallel to its slant Side, whose Section being a Parabola, the Abscissa thereof 37.5 Inches, and the Semi-ordinate 25.9807, required the Cone's Dimensions, when the convex Surface is the least possible.

XIII. QUESTION 511, by Mr. Edward Johnson, of Hull.

REQUIRED the Dimensions of the least parabolic Conoid, whose Equation is $yx - y^2 = 2$, that will circumscribe a Sphere, whose Diameter is 50 Inches.

XIV. QUESTION 512, by Mr. Johnson.

IF a Piece of dry Oak, in the Form of the Frustum of a square Pyramid, (whose Length is 25 Feet, and the Sides of the oblong Ends 28 and 8 Inches, respectively,) be supported in a horizontal Position by a Prop at each End; it is required to find the Weight sustained by each Prop; and also how much the Props at the small End, must be shortened, so that each Prop may sustain an equal Weight.

XV. QUESTION 513, by Mr. Johnson.

GIVEN the vertical Angle of a plain Triangle = 70° , the Sum of their Sides = 176, and their continual Product = 142000; to find the Sides separately.

XVI. QUESTION 514, by Mr. Michael Taylor, of Marley-hill.

IN North Latitude, in a certain Day of the Year, 1773, the Shadow of my Walking-Stick, 5½ Feet long, standing perpendicular to the Horizon, at 7 in the Morning, was 8½ Feet; and, 4 Hours after, its Shadow in the same Place was but 6½ Feet: Required the Latitude where, and Day of the Year when, this happened, by a quadratic Equation.

XVII. QUESTION 515, by Miss Polly Stow.

REQUIRED the unequal Diameters of a Cask at both Ends differing by 6 Inches, to be made so, that the Bung Diameter, and also the Length, shall be 40 Inches each, to hold the most Champaign possible; and what will its Content be in Gallons? and what the Form of the Cask?

XVIII. QUESTION 516, by Mr. Alexander Rowe.

QUÆ est Area Curvæ, cujus Equatio est $\frac{x^{12}}{3a - 2x} = y^4$?

XIX. QUESTION 517, by Mr. Wm Hayes, of Frodsham, Cheshire.

GIVEN the Perpendicular of a plain Triangle, 19, the Ratio of the Segments of the Base as 2 to 3, and the Ratio of the Sides as 3 to 5, to construct this Triangle and give its Dimensions.

XX. QUESTION 518, by Mr. Hayes.

A Point in a right-angled Triangle is distant from the 3 angular Points, 20, 40, and 50; required the Sides of that Triangle.

XXI. QUESTION 519, by Mr. Michael Taylor, of Marley-hill, near Newcastle.

GIVEN the Sum of the Axes of a Spheroid equal 100, and the Solidity of the greatest inscribed Cone to the Solidity of the greatest inscribed Cylinder as 2 to 3: Required the Dimensions of the Spheroid, with the Investigation.

XXII. QUESTION 520, by Gemini, of Morpeth.

THE Difference between the Area of a right-angled Triangle, and its circumscribing and inscribed Circles = 228.6 and 45.7344 respectively. Required the Triangle.

XXIII. QUESTION 521, by Mr. John Harrison, of Helsby, Cheshire.

I bought a Cheese of Margery Seve,
(To tell the Truth, I paid her not),
And we have both the Weights forgot:
A Segment of it does remain,
The Girth'did thrice the Arch contain;
Twelve Pounds this Segment weighs also;
The Weight o' th' Whole I fain would know.

XXIV.

THE BRITISH PALLADIUM

XXIV. QUESTION 522, by Mr. Thomas Sadler, of Whitchurch, Shropshire.
INGENIOUS Artists, whose Industrious Skill

Is sure to find, seek after what you will;
Name me the Prize, that Wisdom's Favourite gains,
When crown'd with Laurels on *Britannia's* Plains!

*The Word, denoting this Requisition, is composed of 4 Letters; the Sum of their 4 Places in the Alphabet is equal to 24; the Product of their 4 Places equal to 360; the Product of the 3 last Letters Places is equal to 60; and the Product of the 1st, 2d, and 4th, Letters Places is equal to 30: Required the Word, denoting this Requisition, by a quadratic Equation.

XXV. QUESTION 523, by Mr. William Pen, of Chalfont.

A Cone is 32 Feet long, and its Circumference at the Base 16 Feet; to find the Content thereof in Feet, by an infinite Number of Circles taken in each Middle Part measured; according to the common Method of measuring Solids; by $\frac{1}{4}$ of the Girth squared and multiplied into the Length.

XXVI. QUESTION 524, by Mr. W. Wilson, of Norwich.

IF the Diameter of a cylindrical Vessel be 20 Inches, required its Depth, that, when filled with Water, or any Fluid, the Pressure on the Bottom and Sides shall be equal to each other.

*Whoever sends the best Answer to the following Question, before the beginning of April, has a Chance, by Lot, to win 12 Palladiums: Debitur Dignissimus.

PRIZE-QUESTION, by the Palladium-Author, Junior.

TO determine the greatest Number of Acres of Land that can be enclosed by 5 given straight Fences, of 1000, 2000, 3000, 4000, and 5000 Yards Length, respectively, with a 6th straight Fence, required. And also to give a general and practical Rule for inclosing the greatest Areas by any Number of straight Sides given, with, and without, another Side required.

To the PALLADIUM-AUTHOR.

WITH Joy, O my Friend, I behold, ev'ry Year,
Your Book with additional Graces appear;

Unlike the weak flimsy Productions of th' Age,
Instruction and Pleasure adorn ev'ry Page.

Still, still, may it flourish, still shine in our Schools,

And by all be admir'd except Madmen and Fools. ISAAC GUMLEY.

Prizes won. — Practical Navigator 12 Prize Quest. Palladiums; Mr. Isaac Gumley, of Countessborpe, 5 Prize Enig. Ditto; Miss Polly Stow 4; Mr. Penn, of Chalfont, 3. Investigator, 2 Prize Quere Ditto; Criticus, 3; Polydore, 2. Who are desirous to send to Mr. Cole's, in Fleet-street, in their own Hand-Writing, for the same. Mr. Alex. Rowe's Palladiums, for 1773, are still there unsold. — More of the Palladium-Society in our next.

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